The Dental Digest.

Vol. VIII. CHICAGO, FEBRUARY, 1902. No. 2.

Original Contributions.

RECURRENCE OF CARIES UNDER GOOD FILLINGS.

By H. A. Smith, D D S., Cincinnati Read before the Cincinnati Odontological Society, May 31, 1901.

We have heard much the past few years of the proper preparation of cavities in relation to their enamel margins. As a result of these studies in "extension for prevention" interest has been revived in the question of recurrent caries away from the margin in the bottoms of cavities that have been well filled with gold or other permanent filling material.

A notable paper bearing on the subject was read before the International Dental Congress in Paris last year by J. Choquet, Professor in the Dental School of Paris. The main purpose of the paper, the author stated, was the study of the etiology of dental caries, in relation to the recurrence of decay under carefully inserted fillings in thoroughly cleansed and properly prepared cavities.

This statement brings up the question of proper cavity preparation, at least so far as the removal of softened or carious dentin is concerned. Before the establishment of the germ theory of dental caries, it was the practice with thorough operators to remove all traces of softened or discolored dentin, even at the expense of pulp exposure. Dentists of this school believed an exposed pulp carefully capped was not so liable to give after-trouble as one over which a covering of partially decalcified dentin was left. At the present time there is apparently no hesitation about leaving a layer of infected dentin over the pulp, reliance being placed upon antiseptics for complete sterilization of the infected layer. That the hasty methods now in vogue for sterilization of cavities should result in frequent failure is to be expected.

It is usual to assume that in the zone of infected dentin the bacteria are arranged in platoons in alignment, when the actual condition is that the advanced guards or pickets, so to speak, are far in

advance of the main army of invasion. Sterilization would be comparatively easy if the bacteria were massed; the real difficulty is our inability to reach with our antiseptics the collection of bacteria in single tubuli beyond the so-called second layer in the carious process. Frequently in our antiseptic treatment these microorganisms have not been disturbed in the least in their habitat; they still live, proliferate and excrete lactic acid. Quoting Prof. Choquet, who believes, as do also Galippe and Miller, that "notwithstanding all the care used in the preparation of a cavity and the subsequent filling we can never affirm there will not be a recurrence of decay." There is no other explanation he thinks of for those cases in which fillings have been inserted for five, ten, fifteen, or even twenty years, about the walls of which no leakage has occurred, and yet under these fillings is found softened or discolored dentin which in time will cause the destruction of the pulp. It is necessary to admit in such cases that the cause is an internal one, and that it has developed as the consequence of the presence of certain microorganisms in the tubuli of a kind of dentin which appears to the eye and touch healthy.

In order to study the morphological and functional changes that occur in bacteria of caries found under fillings that have been placed for several years, Choquet instituted a series of experiments of inoculation. From three perfectly filled teeth he succeeded in isolating five species of microorganisms. A pure culture was obtained from one of these teeth—a lower molar which had been filled for seven years on the buccal surface, and which was extracted to prevent trouble accompanying the difficult eruption of a third molar. Choquet describes this species as a bacillus of slow development with a tendency to grow best without the presence of oxygen. With a pure culture of this bacteria he proceeded to produce dental caries in living animals. Heretofore all attempts to produce artificial caries have been upon teeth out of the mouth, and notwithstanding that specimens of artificial caries have been frequently shown by Miller and others that could not be distinguished from natural caries, there have all along been those who rejected the chemico-microbic theory of dental caries, because the specimens experimented with lacked the life element. The late Doctor Atkinson said "There is no one of those cases that cannot be discerned in an instant as to which is natural and which is artificial."

In these experiments of inoculation the sheep was selected because of the docility of the animal, and also the resemblance of the animal's anterior teeth to the human incisors. One of these experiments Choquet describes—a cavity was carefully made in the labial surface of a central incisor 3MM in depth. A small drop of bouillon which had been inoculated twenty-four hours with the pure culture was deposited in the bottom of the cavity and covered with a thin platinum cup. The cavity was then filled with cement. All precautions were observed throughout the operation to maintain an aseptic condition. Nine months afterwards the animal was slaughtered and the following phenomena were observed: "The dentin, instead of being white as it normally is, was of a yellowish hue and was also softened. The softening, reaching a slight depth, was very plain and more noticeable at the portion of the cavity where the diameter had increased." A small portion of this softened dentin was removed, and on inoculating the same kind of media as originally used the same species used for the original inoculation was recognized. "Thus was demonstrated the possibility of producing artificial caries in a living animal."

It will be seen that these investigations of Choquet are unique and a study of them in detail as given in the original paper cannot fail to be useful to the dentist in his everyday practice. I will briefly relate a case which occurred recently in my own practice in which Choquet's investigations and conclusions were especially helpful in diagnosis. The case was one of obscure facial neuralgia. The patient, twenty-five years of age, seemingly in the best of health, applied to be relieved of pain of an intermittent character which she thought might be associated with some lesion of the teeth. A careful examination of the teeth on the side affected showed three superficial cavities, and these I at once filled permanently. An approximal, somewhat deep-seated cavity for prudential reasons I filled with gutta-percha. Believing the pain was not due to pulp irritation by reason of these cavities, I prescribed quinin in tonic doses, two grains three times a day for six days. The paroxysms were not so frequent and the pain was less severe during the quinin treatment. In a few days, however, severe intermittent pains returned. At this stage of the case my attention was centered upon a lower second molar which had been filled on the occlusal surface with gold five or six years before. The character of the

filling was excellent, and notwithstanding that there was not the slightest evidence of recurrent caries about the margins of the cavity, I decided to remove the filling to see if there was not recurrent caries under it I found the cavity of medium depth and the dentin in the bottom for two-thirds its extent was hard and natural in color; the remaining one-third in a labial direction was softened and slightly discolored, thus clearly showing the presence of dental caries. I found the disease had advanced lingually under the hard area I have mentioned. The pulp was not exposed. Carefully removing the softened dentin down to a layer sufficient for pulp protection, I applied antiseptic treatment. Oil of cloves and carbolic acid in the proportion of three to one were used. Two dressings were made in seven or eight days, care being taken to seal in each. The cavity within the cavity was then filled with the softer variety of gutta-percha, care being used to avoid pressure on the pulp. After using a cavity varnish the main cavity was filled with oxyphosphate. Now after a lapse of several weeks all neuralgic pains have disappeared. The tooth when last seen responded to the tests for a living pulp.

It being granted in this case that the original filling hermetically sealed the cavity, that there was no negligence in its preparation, and that the usual custom of wiping the cavity with an antiseptic was observed, we naturally conclude that recurrent caries was due to intertubular infection such as I have described. Upon this hypothesis it took five years after the filling was inserted for caries to advance sufficiently near the pulp to cause disturbance. The phenomena observed in the case I have related tends to confirm Choquet's conclusion that "the destructive process of caries may take place under good fillings of whatever material after the lapse of a long time."

The paper which suggested the title of my own, and from which I have quoted, was one of the two or three which were read before the Paris Congress that attracted special attention. I would earnestly recommend it for careful study. I am aware the thoughtless dentist will say it is too scientific and ask of what practical benefit is all this? In answer I beg to remind him—The successful *practice* of dentistry is always based on the *science* of dentistry.

[Dr. Choquet's paper will be reprinted in full in the March DIGEST.—ED.]

Discussion. *Dr. J. R. Callahan:* It is almost impossible to sterilize the substance within the pulp-chamber, and in those cavities where we leave decay I am sure the infection reaches clear to the pulp. The preparation of the cavity is of really more importance than the filling.

Dr. J. S. Cassidy: I should name this paper "The Failure of Good Fillings." Otherwise we might suppose the failure was due to some defect in the preparation of the cavity. As it is, we must suppose the cavity properly prepared, all infected matter removed, and the cavity properly filled. Further, we must restrict ourselves to destructive influences that would bring about decay. These are in the nature of possibilities of attack proceeding from outside the filling itself. We have suggested that recurring caries may come on the surface of fillings as well as under them. In caries proceeding from the surface near the filling we have conditions which must be considered similar to those existing before the teeth decayed at all, but we have in connection with that condition the presence of the foreign body—the filling. If these fillings be foreign in their physical properties—amalgam and gold—we must note that the difference between the two substances and the potentiality in specific heat and other innate properties figure in recurring caries. We do not see decay recurring as a rule on the surfaces of non-metallic fillings. The combining of amalgam and gold in a filling results in the immediate polarizing of the two metals, which is unfavorable to the recurrence of caries. It occurs to me that neurasthenia may influence decay of the teeth. If through nervous perversion such phenomena as absorption of tissues may result, with an accompaniment of excretion of lactic acid, why may not the same thing occur in the pulp of the teeth, the accompanying generation of lactic acid accounting for the recurrence internally of caries under even a perfect filling.

Dr. O. N. Heise: This last suggestion is certainly novel, and perhaps Dr. Cassidy has made a new discovery. We are taught that the pulp is capable of throwing out secondary dentin, so why may it not secrete lactic acid. I fear, however, that if this theory should be substantiated it would discourage care in filling teeth. Dr. Choquet, a French investigator along lines similar to those suggested by Dr. Smith's paper, made experiments to show decay spontaneously reasserting itself under circumstances much like

those given in the paper.* From the details which he gives, however, I am inclined to think that he did not conform closely enough to the conditions laid down to entitle his conclusions to serious consideration. With a cavity carefully excavated and filled I do not think internal decay can occur.

Dr. H. A. Smith: If I intimated that there is no therapeutic value in the filling material I went too far. Dr. Miller's experiments show that copper amalgam prevents to a great extent the growth of microorganisms, but the same is not true of cohesive gold. The theory I have advanced to account for recurrence of decay under perfect fillings finds its analogue in the cases of plants transferred from a tropical to a temperate zone. They may continue to grow, but not luxuriantly, and the microorganisms in the dentin of the teeth develop very slowly indeed, but still they develop. We arrest decay but we do not prevent it.

NITROUS OXID IN EXTRACTION.

By W. A. Roddy, D.D.S., St. Louis, Mo. Read Before the St. Louis Dental Society, May 7, 1901.

You will find my paper in three divisions—1st, Nitrous Oxid, the forerunner of anesthesia and by whom discovered. 2d, The manner in which gas is made and used. 3d, Its effect on patients.

Nitrous Oxid the Forerunner of Anesthesia and by whom Discovered.—The impression long existed that there must be in nature a means to paralyze the nerves of sensation, to alleviate pain in surgical operation, but it was thought this must be done through the medium of the stomach. Sir Humphrey Davy, the discoverer of nitrous oxid gas, first ascertained that it could be inhaled with impunity, and noticed its effect on the human system, producing exhilarating effects and a species of insensibility similar to intoxication, and went so far as to suggest that it might perhaps be used to alleviate pain in some minor operations. From that time no advance was made toward anesthesia, and no further use was made of nitrous oxid beyond illustrating its exhilarating effects upon the human system before classes and assemblies, until December 10, 1844, which may properly be called the natal day of anesthesia. On that day Dr. G. Q. Colton, while delivering a chemical lecture in the city of Hartford, Conn., for the entertainment of his audience was illustrating the effect of nitrous oxid on the human system by

administering it to ladies and gentlemen on the stage. Among them on the platform was Dr. Horace Wells, a prominent dentist. During this exhibition a young man became unusually excited and performed sundry evolutions and gyrations during which he badly contused and abrased his shins by collisions with the benches. In answer to Dr. Wells' inquiry, he said he was not conscious of any injury. After consulting Dr. Colton about it and other incidents of like character, Dr. Wells determined to test the matter by having a tooth extracted for himself. Accordingly Dr. Colton carried a bag of the gas to Dr. Wells' office and administered the gas to him, and Dr. Wells' assistant, Dr. Riggs, extracted a large molar tooth. On recovering, Dr. Wells exclaimed, "New era in tooth-pulling, didn't hurt so much as a prick of a pin." This was the first operation that was ever performed with an anesthetic.

Dr. Wells determined immediately to use the gas in his practice, and at his solicitation Dr. Colton provided him with the apparatus and taught him how to make it—not the simple matter of distilling nitrate of ammonia as to-day, but a laborious process of neutralizing nitric acid with carbonate of ammonia and slowly evaporating in a porcelain vessel, when it must be distilled and washed. Dr. Colton also instructed him how to administer the gas and furnished the necessary appliances. Dr. Wells began its successful use in his practice, giving the gas to hundreds of people, other dentists bringing their patients to his office, until ill health caused him to relinquish it. On August 17, 1847, Dr. Wells administered gas for the first time in a surgical operation, removing a large scirrhous testicle; January 1, 1848, for a thigh amputation; January 4 for the removal of a large tumor. All the operations were entirely successful—no pain or unpleasant feeling being experienced. It might be added that Dr. Wells experimented with vapor of ether and extracted some teeth with its use, but not finding the results as satisfactory as with the gas discarded it.

Two years later Dr. W. T. Morton, a Boston dentist who had been a student in Dr. Wells' office, visited Hartford and found all his old friends telling of Dr. Wells' success in extracting teeth without pain with the nitrous oxid gas. He was at once interested and applied to Dr. Wells for a bag of gas to take to Boston with him. Dr. Wells suggested how cumbersome it was, and advised him to apply to Dr. Charles T. Jackson, a distinguished chemist connected

with Boston Medical School, for instruction how to make and use gas. When approached, Dr. Jackson listened and exclaimed: "Nitrous oxid exhilarates, ether exhilarates—if gas will kill pain, ether will' ; and told him ether was a liquid he could get at any drug store, and he could breathe the vapor off a handkerchief. So Morton got a bottle of ether and gave a bootblack 50 cents to inhale some, then whipped out his knife and slashed it into the boy's thumb. This was the first experiment with any other agent than nitrous oxid, and after conference with Dr. Jackson on September 30, 1846, he administered ether and extracted a tooth for Mr. Ebon Frost, it being their first operation with ether as an anesthetic. It may be added that this was more than a year later than Dr. Wells' experiment with it, but Drs. Morton and Jackson immediately applied for a patent on anesthesia and began the attempt to sell dentists office rights to use it, but soon Dr. Jackson, who was superethical, became ashamed of being mixed up with a patent, sent a request to the Commissioner of Patents that the patent be issued to Morton alone, and they had a clear road.

Wells died, and nitrous oxid as an anesthetic slumbered until the summer of 1863, when Dr. Colton was again at Hartford and vicinity lecturing. At New Britain he mentioned Dr. Wells' success with nitrous oxid and several were eager to try it, so arrangements were made with Dr. Dunham and their teeth were extracted. Dr. Colton then instructed Dr. Dunham how to make and use the gas, and went to New Haven, where he mentioned in his lecture the success in Hartford and New Britain and announced that he would be at the office of Dr. Smith to accommodate those who might desire to avail themselves of the use of the nitrous oxid. He remained with Dr. Smith one month, during which time they extracted 1785 teeth. This was the revival of nitrous oxid. The matter came to the ears of the famous showman, P. T. Barnum, and at his suggestion the Colton Dental Association was formed, consisting of Dr. G. Q. Colton, P. T. Barnum and Dr. John Allen, the inventor of continuous gum teeth. The Association established branch offices in all the large cities.

The Manner in which Gas is Made and Used.—In order to have perfectly pure gas, first see that the apparatus you use is in perfect condition; then test the ammonia by taking half tumbler of water, put one teaspoonful of ammonia in glass of water, and if the water

becomes milky it will not do to use. After procuring pure ammonia, place two to three pounds of ammonia salt in the glass flask, then apply heat. Great care should be taken to guard against excessive and irregular heat. Ammonia salt melts at about 230 degrees; at 396 degrees it begins to decompose into nitrous oxid and water, yielding 36 parts water and 44 parts gas. When the heat is allowed to rise much higher than this point deleterious compounds form with the nitrous oxid, which if allowed to any considerable extent may prove fatal to health and life. When at the proper heat, that is, when melted, make the connection with the water bottles, having at least three bottles, one to contain caustic potash to destroy all impurities. Allow the gas to flow through the bottles into a tank of water, where it should stand from six to fourteen hours before being used, the water taking up the impurities. I prefer gas from twenty hours to three days old, for while it takes more gas to get the patient completely under the influence, the after effects are better, not leaving the patient with headache or nausea. The fresh gas has a longer effect than the older, so when there are a number of teeth to extract I use the fresh gas. I use an inhaler which does not have a rubber cup to cover the face and frighten children, or even grown people. I do not use the rubber bag for measuring the amount of gas to be given, but take it direct from the tank, using my own judgment as to when I can begin to operate, by lifting the hand, or watching the eyes, or moving the head to see if the muscles have relaxed, and by the breathing. I have used gas on persons of all ages, from three and one-half to seventy years for extraction of teeth and have found but few cases where it could not be employed. Not long since a physician came in my office with a patient who was suffering with a "bone felon." While he scraped the bone I administered gas and kept her under the influence five minutes with no bad results whatever.

Its Effect on Patients.—If there are any bad results after taking gas, I use spirits of ammonia. I have never had any serious trouble, and believe when pure gas is given by one who knows how to use it there will be none. By having the patient take a long, deep breath anesthesia will be produced much quicker than by short breaths. The difficulty in putting a patient completely under the influence of gas is caused by a leakage of the valves in the mouth-piece, or the lips may become loosened around the mouth-piece.

Especially is this the case with a man who has a short, stubby beard, or on a hot day when the lips or fingers in holding the lips to the mouth-piece perspire. In cases where there are more teeth than can be extracted with one administration, I wait from 10 to 15 minutes before the second administration. The general impression is that gas should not be given to fleshy people when the vital forces are below normal, or to intemperate people and consumptives, but I have given it to all kinds and classes and have never had the least trouble. I am firm in the belief that when one is suffering from heart trouble the shock to the system is greater in extracting a tooth without gas than with it.

DENTISTRY AS A SPECIALTY OF MEDICINE.

By Dr. O. N. Heise, M.D., D.D.S., Cincinnati. Read Before the Cincinnati Odontological Society, March 29, 1901.

The subject for consideration to night is one which has been agitated not only by the dental profession but by medical men as well. Some months ago a symposium on dental education was held at the meeting of the American Medical Association, and I cannot do better than to quote from an editorial in the *Journal of the American Medical Association* for June 16, 1900, on this subject. "Medical educators will be deeply interested in the symposium on dental education held by the Section on Stomatology at the Atlantic City meeting of the Association. This symposium deals with every phase of the subject. The paper by Dr. N. S. Davis has special interest, and that the views therein, which were advanced more than four decades ago, are of more value to-day than when first expressed is shown in the later discussions of the same topics by others. On perusal of these papers it will be generally admitted that advanced education is necessary for the successful practitioner of stomatology at the present time. This idea is gaining ground among dentists, and the term for their science is an evidence of the advanced conception held to-day by many dental societies of the status of dentistry as a specialty of medicine. As shown by this term, the dentist has ceased to be a mere tooth-carpenter and has become a medical scientist. Dental science has brought diseases of the mouth, jaws and teeth so obviously under the domain of general pathology that somatic problems elsewhere presented are best and most easily studied in the mouth. This is particularly true of teratology,

embryology, excessive and arrested development, especially as related to race advancement and degeneracy, as has been shown by Talbot. Factors of acquired degeneracy, like the drug habit, mercurialization, etc., neurotrophic and diathetic states, have nearly all their pathologic phases outlined in the interstitial gingivitis. (Talbot.) To enable the dental student to successfully treat these lesions he should have a broad training in the fundamental branches of medicine, such as anatomy, physiology, pathology, bacteriology, materia medica and chemistry. It will not do to have these sciences taught in the dental school, even by the same teachers, because a student acquires the idea that they are not necessary to a successful practitioner of dentistry. Dentistry as practiced to-day by the better element is a part of general medicine. The same requirements should be exacted for the entrance of the dental student as for the medical. They should be taught in the same class and in the same manner. The first examination should be as exacting for one as for the other, and no distinction should be made between them."

Not long ago Dr. C. M. Wright read an excellent paper on "Outline and Detail Medical Study" which pleased me greatly, as I thought he had always opposed the idea of dentistry broadening out and becoming a pure specialty of medicine, which it must do in order to fulfill his prediction that "the prescription pad and systemic remedies will be as potent weapons in the hands of the dentist in the future as are digital dexterity and instruments to-day." I might mention in passing that Dr. F. A. Hunter, who for years has been opposed to this idea of broadening dentistry, now admits that it is only a question of time when all dentists will be medical graduates. He thinks it will not be in the near future, however, and I do not believe it to be close at hand, because the college element of our profession will hinder its rapid development, partly on account of the financial conditions involved as affecting those in control of the colleges, especially the independent ones, and also for the reason that you cannot change those opinions and ideas for which men have worked for many years. It is the nature of man to cling to the thoughts handed down to him—"That which one age tells to another seems to men truth fundamental." The thralldom of the age to tradition is peculiar, but we have at the present time outgrown it to a large extent. Think, however, of the time when William Harvey discovered the circulation of the blood. He was

accounted crazy, his practice declined, and a pack of "barking dogs," as he called them, was soon at his heels. "Would you have us believe that you know something that Aristotle did not know?" demanded one adversary, Dr. Primrose, adding, "Aristotle observed everything, and no one should dare to contradict him." The voice of Primrose was the voice of the age. No man over forty accepted Harvey's ideas, and half a century later the medical faculty at Paris petitioned the king to prohibit the teaching of the circulation, as a doctrine contrary to the authority of Aristotle. The same treatment has been accorded every new idea or invention. When railroads were first constructed the doctors of Bavaria declared that they would cause the greatest deterioration in the health of the people, because such rapid movement would cause brain trouble among travelers and vertigo among those who looked at moving trains.

That the dentist should have a thorough medical training is in my mind a settled fact, and it seems to me that it cannot be obtained in the average dental college. Why should not the student acquire his knowledge of medicine at the fountain head, from men who have studied these branches more thoroughly than any dentist would or has the opportunity to do? Where also he can have the advantage of practical laboratory courses of instruction in all the various branches, which the dental college does not give. Again, the hospital instruction and clinical work are of paramount importance in giving broader ideas than he can get from spending all his time in the dental clinic. The chair of oral surgery gives the dental stunent an opportunity to witness operations other than the strictly dental ones, but he should see more than a few such operations during the year. He should obtain a knowledge of general medicine, not from books alone but by clinical instruction as well.

One of the foremost rhinologists and laryngologists in this country recently said, "The demonstration of the important relation of general medicine to dentistry, which is being shown by a number of scientific articles, is a neglected field. The relation of facial contour and the upper arch to nasal breathing in early childhood cannot be overestimated, in fact, it is nasal breathing which controls the regular development of the facial bones and especially the superior maxilla. A thin alveolar process in the upper jaw, from lesions of the teeth, may cause by extension of inflammation, by continuity of

structure, lesions of the floor of the nose or of the antrum; or, on the other hand, deflections of the septum or spurs situated close to the floor of the nose, by the inflammatory action set up on the surrounding structure, may bring about inflammation and diseased condition of the teeth in direct line of obstruction. The stomatologist should have a thorough knowledge, not only of the nasal cavities and accessory sinuses, but also of general medicine, and, indeed, a general practitioner or specialist should have a more thorough knowledge of stomatology."

The administration of anesthetics, the injection of cocain, etc., as ordinarily done by the dentist is likely to bring discredit upon the profession. Patients are given nitrous oxid gas when the dentist has no idea of their general condition. In fact, is the average dentist equipped to ascertain even in a general way the condition of the heart, lungs, kidneys, etc., and in case of any serious trouble during the administration is he qualified to take care of the patient? Does he not invariably call in a physician instead of a brother dentist, thereby acknowledging that we as dentists are not competent to undertake cases where life is at stake. What would be the criticism in a fatal case where no physician was called? Would it be the same if the accident or fatality occurred at the hands of an oculist, aurist, rhinologist, laryngologist, or any other medical specialist, who had not called in medical aid? We know that the dentist would be censured, in fact, it has even been suggested in certain quarters that dentists should be prohibited from giving anesthetics except in the presence of a physician. Other countries, like France, will not allow American dentists to administer anesthetics, or even inject cocain, etc., unless they have complied with the French law regarding dental education, as over there they require a better medical training than our dental colleges give. While I was in Paris last summer this was told me by an Ann Arbor dental graduate. He had intended to begin practice in Paris, but before he could do so he had to spend some two years in study and in attendance upon one of the dental colleges. At first he considered this a hardship and an injustice, as he felt capable of undertaking any dental operation as well as any French dentist, but when the ordeal was past he realized the deficiency of our method of giving only theoretical medical training in the dental schools.

Some men, like Dr. James Truman and others, advance the idea

that "in proportion as we aspire to build up our curriculum so as to produce M.D's., just in that proportion will dentistry deteriorate." This is in line with the ideas held by the past generation of business men, that boys who had a high-school or university education did not make good business men, as such education prevented a thorough training in business, the early and adaptable years being consumed in acquiring knowledge which could not be used afterwards. The facts are, however, that the leaders in business enterprises to-day are men of broad and liberal education, and where it was not obtained in college it has been acquired by self-education in after years, showing that these men felt the need of it. It is a common thing to-day to see graduates of universities enter business houses and, owing to their superior mental training, master the details of the work in a short time, where failure would have resulted without the trained mind. Those dentists who object to a medical training for the dental student do not understand nor appreciate the full scope and importance of our profession. Those men who are satisfied with filling teeth and making plates are like the simple-hearted ancient geographers who wrote on their maps of the world, besides the columns of Hercules (representing the Straits of Gibraltar), "Here ends the world."

One of the principal objections urged against this broadening of our education, or as Dr. Wright puts it, "The bringing up of our outline work," is that the dentist thereby loses in fingercraft or dexterity of manipulation, that he becomes too theoretical and not practical enough. I fail to see why he should become less expert on account of being better equipped mentally, for in the very act of obtaining the desired knowledge he is required to do considerable work with his fingers, and the laboratory courses demand much manipulative ability. We see the result of such study in the men who take up the various specialties of medicine. Look at the oculist, aurist, the general and special surgeon, in their various fields of work—are they any less expert in their operations or handling of instruments than is the dentist? Many of them will outstrip him in skill and dexterity. Consequently, it seems to me that a thorough scientific medical training does not detract one iota from a dentist's manual dexterity.

Discussion. *Dr. C. M. Wright:* When we treat an exposed pulp, an abscess, a case of pyorrhea, or any lesion of the parts

closely related to the teeth, we are practicing a specialty of medicine in as strict a sense as does any other specialist. So much must be conceded, whether we accept or reject the dictum that dentistry is a specialty of medicine. During the last thirty years a decided change has taken place in dental practice. Who at that time treated pyorrhea? The majority of dentists then extracted all so-called ulcerated teeth. When a few thoughtful, progressive men began to treat these affections they were unconsciously but none the less certainly taking the first steps towards establishing dentistry as a specialty of medicine. If we have any real ambition to be recognized as part of the great medical body we can attribute our failure to have already attained that end to our custom of basing our estimate of each other on the ability to fill teeth, treat abscesses, make dentures, etc., and to the common fault of openly detracting from one another's skill as a dentist by such statements as "He is a poor operator and plate-worker," etc. I think we are not specialists in medicine because the principles of practice in medicine and in dentistry are radically different. While I in a way agree with Dr. Heise that dentists should have a more liberal medical education, and trust the profession will come up to the standard he sets, I say the greatest drawback to the realization of such a hope is in the present failure of the rank and file to recognize the necessity of the step. If any one of us should give up the filling of teeth and everything that pertains to the purely mechanical nature of our services, and devote himself solely to treating oral lesions, he would then become a medical specialist within our own lines.

Dr. F. A. Hunter: I do not believe the dentist is any better as a dentist for having the medical degree, and the leaders of our profession to-day are those who do not hold it. At present we are a separate and distinct profession, having our own colleges, literature, methods and aims in the nature and substance of what is taught the students. The time may come when the medical degree will be required of the dental matriculate, but I doubt whether that time is near at hand. I furthermore question the correctness of Dr. Heise's assumption that anatomy, physiology, therapeutics and allied subjects are any more readily assimilated by the dental student in a medical college than by the same student under the teachings of a medical professor in a dental college. Why should they be? Of course it is obvious that the dentist often verges on the borderland

of medicine and sometimes actually practices it, but for all that the practice of dentistry is so essentially different in most respects from that of medicine that they may be said to have very little in common. The relationship of the two is not of sufficient importance to make it incumbent upon the dentist to qualify himself as a physician. I have said that generally we as dentists are not regarded as medical specialists. In hiring the dentist under contract the United States government recognizes him merely as a laborer, and he has no rank as an officer as has the army surgeon.

Dr. W. M. Williams: I thoroughly approve of the advanced position Dr. Heise takes in his paper, and I have always advocated raising the standard of dentistry as high as possible, on the principle that what we claim for ourselves the public will ultimately accord us. Dr. Hunter puts the matter in an unnecessarily harsh light in using the word "laborer." In both the army and navy the government employs surgeons and physicians under the same conditions of contract, and no one regards it as a reflection on the medical profession. To be sure, the army and navy have also other surgeons who hold the regular title and rank of officers, to which the dentist has no chance of attaining, but the regular officers have always opposed the conferring of any army or navy titles on surgeons or physicians, so the dentist is no more humiliated than the surgeon has always been. Furthermore, the dentist has only recently been admitted to either branch of the service, and we have sufficient ground for congratulation that so much has been achieved, without endeavoring to detract from the honor of the recognition which our profession has received from the government.

Dr. H. T. Smith:. I do not accept Dr. Heise's statement that throat, nose, eye, ear and other specialists have digital dexterity and skill equal or superior to that of the trained dentist, for the average dental operator would easily take precedence over the average operator in any medical specialty. It has been asked whether even the making of a bridge does not depend on a certain anatomical preparation of the teeth which may be characterized as belonging to medical science. This might be conceded as a matter not particularly significant in its bearing on the question. Dr. Heise assumes that the dental student is not well grounded nor ordinarily interested in pathology, histology and other branches which receive much attention in the medical school, but this is a mistake, and the dental

student is as likely to be deeply interested in these subjects as is the medical matriculate. One thing which would militate against having the dental student first take the medical degree is, that it would in most cases postpone his entrance into the dental college until the twenty-fourth or twenty-fifth year, and at that age the ability to acquire finger-craft is not so great as earlier in life.

Dr. J. R. Callahan: In the main I heartily endorse Dr. Heise's views, and I have always regretted that I did not take a full medical course before entering the dental college. The question may be asked why dentists were not long ago appointed to the army, and I believe it is because of the estimate which they placed on themselves and because of the opinion of the dental profession which they have caused to go throughout the world. Another thing which has exerted its influence against us is the fact that a large number of dentists have received the honorary "M.D." title, but very few have actually taken the hospital course.

Dr. F. W. Sage: I am distinctly in favor of anything which makes for the better equipment of the dentist and the elevation of the profession, but I must still maintain that dentistry is sui generis and that it cannot be merged into the medical profession because it ministers to its patients in a wholly different way, which is largely mechanical. The question is not entirely what we would like to be, but what our patients wish us to be. I will go further than Dr. Hunter and say that some of the most brilliant men in the history of the dental profession were incapable of profiting by a medical education. They were so distinctly mechanical in the quality of genius they displayed that they could never become interested in the generality of the subjects which engages the medical student. Nevertheless, they served their patients well and were esteemed peerless as dentists. At the present day men with meager attainments in medical knowledge are serving their patients with the same degree of satisfaction. No argument is required to establish the fact that when the average of young men who apply for matriculation at the dental colleges is taken, a superficial observation shows that they have not the mental make-up of medical students. They are moved to enter a dental college largely by mechanical instincts. A man with this mechanical bent cannot be forced to absorb a large amount of theoretical knowledge on subjects not closely allied to the mechanical subject of dentistry. The question

is one of temperament, and it is vain to attempt to force upon any man a system of training which meets no response in the impulses of his nature.

As regards the medical profession, it is a question whether the men who have given dentistry the most encouragement to fully identify itself with the parent body have the slightest appreciation of the patient application necessary to acquire the digital facility which alone renders the dentist of special value to his patients. The physician admires the dentist who comes nearest to being a physician, for then for the first time he understands him, but he does not at all understand him as a dentist and does not especially admire him. Why should the dentist expect to practice even plastic surgery of the face or mouth? What are specialists for? Why does not the rhinologist or larynologist occasionally operate on the teeth? Granting that a large majority of the dentists could be qualified to practice oral surgery in the fullest significance of the term, would they be called on to any considerable extent to so practice, and could they be expected to compete successfully with the surgeon enjoying a far greater range of opportunity in the same line? As a matter of fact, dentists who practice dentistry acceptably usually have their hands full. To keep pace with the advancement of strictly dental science is enough for the average man. Finally, all the knowledge of medicine which the dentist needs he should be able to get in the dental college. For what other purposes have the colleges extended their course a year, looking to a further extension in the near future? On what rational ground can it be maintained that chemistry, therapeutics, anatomy, histology, etc., cannot be as thoroughly and satisfactorily taught in the dental college as in the medical college? Personally, I freely admit my regret that I did not take a full medical course, but at the same time I am not in sympathy with anything which belittles dentistry as regards its standing independent of any closer relationship to the medical profession, and I believe the dental colleges are in all respects the best medium for qualifying the incoming dentist for the practice of his profession.

Dr. H. A. Smith: The trend of modern education is to fit the young man specially for the occupation which he is to follow. Beyond that there can be no objection whatever to an acquisition of broader knowledge. The requirements made upon us as dentists

are gradually broadening and our colleges are extending their courses of study to meet these demands. Our essayist was a skillful dentist when he held only the dental degree, but having acquired the degree of M. D. for the purpose of practicing rhinology in connection with dentistry, he naturally thinks he acquired useful knowledge for the practice of dentistry that he would not otherwise possess. I contend that Dr. Heise, with his habits of study, would have acquired the needful knowledge without the aid of strictly medical teachers.

Dr. Heise, closing discussion: I cannot agree with the opinion repeatedly expressed here to-night, that the dental colleges afford the same advantages to the student in histology, pathology, bacteriology and physiology as do the medical schools, for the former lack the advantages of properly conducted laboratory courses and the practical clinical instruction in medicine. Of what use is book knowledge of medicine without practical application of same? In this regard the dental colleges will always be deficient.

As to the statement that dentistry is sui generis and cannot be merged into the medical profession because of its mechanical nature, I would reply that it is not more so than some of the specialties of medicine. Ophthalmology is perhaps more like dentistry than any other in this respect, being largely mechanical. Take, for instance, the examination of the eye and the prescribing of glasses—a mechanical operation in every sense of the word. It is true that the oculist does not grind his own lenses, make his own spectacle frames, etc., but a great deal of the purely technical in dentistry could and should be much better done by men expressly trained for the purpose, working under the supervision of the dentist.

As to the statement that the average dentist possesses more digital dexterity and skill than the average medical specialist, we must not imagine that other specialists are bunglers in this respect, for many of them are first-class operators and equal to any dentist. Some of them might be better, but the majority of dentists are not up to the standard.

It is to the disadvantage of dentistry that it was ever divorced from the medical profession, as happened in the time of Dr. Chapin A. Harris, for it would have been further advanced as a science and have been more efficient in many ways than it is to-day if that separation had never taken place.

CONSIDERATION OF CONDITIONS OF THE INTERPROXIMAL SPACE.

By J. T. Meadors, D.D.S., Columbia, Tenn. Read before Southern Branch National Dental Association, at Nashville, July 29-31, 1901.

However simple this subject might seem to one at first thought, after a few moments of reflection he soon sees that there are points of very great importance to those practitioners who are desirous of producing the results which are most satisfactory to the comforts of their patients and the durability of their work.

Before entering into the consideration of the subject, you must first know the condition as it normally appears, hence I will briefly refresh your minds as to the anatomical and physical makeup of the interproximal space. When the teeth occupy their proper position in the dental arch, their proximal surfaces are supported one against the other at a point near to the occlusal surface of the teeth, known as the contact point, causing by such an arrangement a triangular form between the teeth, the basis of which is made by the border of the alveolar process and apex at the contact point. This space is normally filled with gum tissue which has an arched form bucco-lingually, the crest of each arch being near to the contact point. Provided the point of contact is small, while masticating any fibrous foods the mass is severed at this point of contact, and as a result of the form of the gum tissue, as well as its elasticity, the food is passed from the region of the interproximal space.

When by decay the proximal surface of a tooth is lost, especially when the decay has been so extensive as to cause a breaking down of the proximo-occlusal border, the teeth seeking support one against the other move closer together and thereby nearly obliterate the interdental triangle, causing the gum tissue to festoon abnormally on the buccal and lingual surfaces. Because of the improper contact of the surfaces of the teeth, fibrous material and foreign matter wedge into this space and crowd the gum tissue in such a way as to reverse the arched arrangement, and by decomposition cause an inflammatory condition of the tissues adjacent thereto. In such cases and under such conditions you will find that of necessity your first act will be to separate the teeth by use of cotton or gutta-percha, and restore the original conditions by properly inserting a filling so contoured as to produce a contact point near to the proxi-

mo-occlusal angle, not broad but of sufficient strength and density to prevent the wear of the point by lateral motion of the teeth while masticating. The interdental triangle having been restored, the abnormal festoons soon disappear and the gum tissue resumes its natural crest form. Should you make the contact point broad and the surface of your filling flat, you will find the wedging of foods into this space a source of great discomfort to your patient and a too frequent cause of failure of your filling.

Upon careful examination of a set of teeth properly arranged in the arch, which can best be studied by inspecting a skull, you will find the point of contact of each tooth very small, practically of not sufficient width for measurement, and varying upon the surfaces of certain teeth. Close inspection will reveal the fact that the point of contact upon the superior bicuspids and molars is nearer the buccal surfaces than the lingual, whereas in the lower arch the contact point is nearer midway between the buccal and lingual surfaces. You will also find as a rule a great difference in the surfaces of the teeth, for instance, the first superior molar is upon the mesial surface prominent at a point towards the bucco-occlusal angle, and then falls away very rapidly towards the gingival and towards the lingual, whereas the distal surfaces of all molars are decidedly rounded and broad, falling away to the gingival. The most decided difference in the location of the contact point is observed in the case of the bicuspids, the point with the superior bicuspids occurring decidedly towards the buccal, whereas, because of their rounded form, the point with the lower bicuspids occurs nearer midway between the buccal and lingual surfaces.

Your attention has been called to these anatomical conditions in order that when inserting gold fillings or constructing gold crowns you may as closely as possible imitate nature. I have always favored making the contact point upon my fillings in the superior bicuspids nearer midway between the buccal and lingual surfaces than occurs in nature, because I desire that after the food is parted both the buccal and lingual borders of the filling may be equally polished by the passing of an equal amount of food over each margin.

Another condition which too often causes discomfort to your patient and failure of otherwise good work is the overhanging of filling materials. In large cavities upon the proximal surfaces, especially where the filling extends beneath the gingival margin, it

is hard to know that you have removed all the overhanging material. With gold you find it difficult to polish down to a smooth surface flush with the enamel margins, and with amalgam you frequently find upon the return of your patient that some of the material while soft has worked up beyond the cavity margin, and has set and become a source of irritation to the tissues of the interproximal space. Other conditions, such as accumulation of calculus or wedging of broken toothpick or straw into the interdental space, are common to us, as we have these to deal with daily because of the discomfort of our patients. All of this I cite because of the too little regard we as a profession have for the proper care of this important space. The operator who files between teeth and reverses the interdental triangle, no matter how dense may be his filling, or how flush it may be against the enamel margins, has by reversing this triangle done his patient a very serious injury.

In testing the proper relation of teeth one to another as regards the interdental space the floss silk is of greatest assistance. In passing the floss between the teeth you will find that it is brought to a stop at a point near the occlusal border, and with some little pressure it snaps into the interdental triangle and moves laterally with proper freedom. Upon removal you will find that the floss passes over the surface of either tooth with ease until you again reach the contact point where you are required to use a little force to remove same.

A proper knowledge of the anatomical and physical condition of the interproximal space, with careful manipulation of his materials, and with the desire for the reestablishment of the contact point, and the determination to make the best of means at hand, classifies the operator as one of those of whom Milton Young wrote:

> "Thy purpose firm is equal unto the deed,
> He who does the best his circumstances allow,
> Does well, acts nobly, angels could do no more."

Discussion. *Dr. Gordon White*, Nashville: This subject is an interesting one, but I am disappointed because the essayist did not give us a single new idea. The only thing that I noticed was the use of gutta-percha for separating teeth, but this method is too slow to be practicable. Gutta-percha is used to hold the teeth apart after they have been separated by cotton or other agents, but this is all, and if Dr. Meadors has some special plan he ought to explain it.

Dr. J. H. Crossland, Montgomery, Ala.: Dr. Bonwill taught the profession years ago how to separate the teeth with gutta-percha, and I supposed the method was common practice with all dentists. Dr. Meadors has done well to repeat and to impress on all of us that the interdental spaces must be protected and guarded, so that food will not be driven by mastication between the teeth and into the gingival tissue.

Dr. R. K. Luckie, Holly Springs, Miss.: In societies we often have papers and clinics that are not new, but where they clearly teach a useful lesson they are worthy of repetition. When cotton is used it must be renewed each day to secure sufficient separation, but one plug of gutta-percha can be left for several days, and it will gradually widen the space between the teeth.

Dr. M. C. Marshall, St. Louis: Such papers as this have been read for years, but nevertheless all members of the profession are not familiar with the principles set forth, as is evidenced by the work which we see is the mouths of their patients. Working without separation causes serious trouble.

Dr. W. V-B. Ames, Chicago: A Chicago lady while visiting in Philadelphia called on a prominent dentist for service. Her teeth had a great many interproximal cavities, and the dentist used pink base-plate gutta-percha to secure the necessary separation. The lady was soon after taken sick and went to the seashore, returning direct to Chicago. By this time the separation between her teeth had become so great that her face was actually deformed by the protrusion of her front teeth. I removed the gutta-percha and filled the teeth, and they returned to their proper positions. I would warn you all not to leave gutta-percha between the teeth too long, thinking that it is not active.

Dr. W. E. Walker, Pass Christian, Miss.: I believe it is well to repeat these important points of practice, as we are all benefitted thereby. In a simple cavity between the teeth gutta-percha is a good filling material, but in a compound cavity of the approximal masticatory surface there is scarcely a limit to the separation that can be secured by using the tough pink base-plate gutta-percha.

Dr. Gordon White: Gutta-percha as used by Dr. Bonwill was not intended for separating, but was a filling material and remained in the teeth for years. By the force of mastication gutta-percha

can be pressed down between the teeth, and if left long enough it will be pressed into the gingival border and cause inflammation.

Dr. Meadors, closing discussion: Notwithstanding Dr. White's criticism I am pleased that my paper has brought out such a full discussion. I do not pretend that it has any absolutely new ideas, but many dentists fill approximal cavities without securing the proper separation, so the points I urged are of enough importance to be frequently repeated. When separating, I fill the approximal cavity with the gutta-percha, leaving some excess, and by the force of mastication it is forced between the teeth and separates them.

ORAL HYGIENE.

By J. P. Corley, D.D.S., Greensboro, Ala. Read before Southern Branch National Dental Association, at Nashville, July 29-31, 1901.

The practice of oral hygiene has long been limited to the narrow confines of the oral cavity, and its most ardent devotees have done little more than insist on cleanliness and proper exercise of the teeth. This, of course, has been in keeping with the mechanical basis upon which our science was premised, but with the advance in dental education, which guarantees to the graduate dentist of to-day a knowledge of biology almost equal to that of the medical profession, he is qualified to institute a broader and more thorough system of hygiene.

The great barrier which stretches its spectral arms across his path is the public's impression that the teeth are things apart, free from the influence of environment, and destined for all time to run a prescribed course, amenable only to operative intervention. Also, the popular impression that the dentist is in fact a *toothist*, pure and simple, as though the object of his care existed as in a test tube. We have been toiling through the tedious years that we might bequeath to future generations more perfect dentures, with approximate immunity from the need of patchwork, yet we have not required that cooperation and assistance from our clientele without which our efforts must ever result in failure. The day when a man could afford to retain a patient who habitually and wilfully neglected his dental organs has passed. On the other hand, the public has been slowly taught to appreciate the intelligent dentist. His people recognize in him the artistic scientist and are usually willing to enter into the spirit of his profession.

It is mainly through the mothers that we can hope for a hygienic regime which will be truly prophylactic in its last analysis. Clinical observation, as well as scientific research, prove that the period of greatest susceptibility is during the time when the patient is still under the care of his guardian. This fact is both suggestive and encouraging. Habits of cleanliness and laws of health can be enforced, and when established at this early age will be more permanently maintained. Then, again, if this critical period be passed with freedom from serious decay comparative immunity will follow. The two great channels through which we can hope to reach this maternal head are the medical and educational professions. It is encouraging to note that some of our medical schools have regular lectures on oral hygiene, as the M. D. thus goes into practice with a greater appreciation of the importance of a prophylactic regimen, and also with some knowledge of a practical dental toilet. Some of the public and normal schools are having illustrated lectures on the subject and are beginning to enforce its technical observation. Let us use our individual and collective influence to further the work in this direction.

After all, however, there is an opportunity which comes to each of us alike, and may be used to greater or less advantage by all—the constant teaching at the operating chair, and a demand for the courtesy due us. To do this with success we must study the individual patient as we would a book. We must know what to say and when and how to say it. Above all we must be firm and uncompromising in our demands. The work is of so great magnitude that the efforts of a few individuals can accomplish but little. Every state, sectional and national society should have a standing committee to push the work and act in harmony with the National committee. These committees should have a representative at every medical and educational meeting in the country.

We have had the privilege of presenting the matter to both of these professions in Alabama and have met with nothing but encouragement from all. I say that the land is ours if we will but rise and possess it. Let us take advantage of the great tidal wave of interest which is to sweep over our country, the advance indications of which are before us, and by a thorough preparation for the exigencies of the hour press the work of hygiene and prophylaxis.

Discussion. *Dr. H. W. Morgan*, Nashville: This subject has

attracted attention from time immemorial, and I am glad to know that some good missionary work is being done among the school children. That is the place to begin. If we are to do this work and do it in such a manner that there will be no opportunity for unworthy men to get hold of it in a way to advertise themselves, it will do a great good. It is work that will have to be done over and over again each year, because you do not have the same crop of children to deal with, so there will be no end to it. Much can be done through the school teachers, if you can get them interested in it. Our school board some years ago prepared a circular letter that was sent to all of the teachers, and they were requested to r ad it to their classes twice a year. Some of the teachers took a great interest in the matter and did a great deal of good in their schools. I think dentists should make more effort to impress the necessity of greater care of the children's teeth upon their patients while they are in the chair. This is a golden opportunity. While the patients are suffering from the neglect of their own teeth teach them that care will preserve the teeth of their children. They will be apt to heed the advice when they realize that the pain they are suffering is the consequence of their own neglect of these important organs. There is a great sentence which old Dr. Freeman frequently repeated to his patients—"Clean teeth do not decay." Many of my own patients have thanked me for that saying.

Dr. Corley said it was well for poor human nature that there were some bright spots along life's pathway. He was getting to the point of believing that oral hygiene is the foundation and superstructure of all dental practice. Dr. Walker, chairman of the committee on oral hygiene of the National Dental Association, has furnished blanks to be sent to dentists and to the superintendents of schools for the purpose of having examinations made of the mouths of school children. To avoid the possibility of jealousy, all the professional dentists in each of the smaller towns should unite in the work and do it together or alternately, or by agreement select some one to attend to it. When the examinations are made all children are given a blank with a report on it of the condition of the teeth. This they carry to their homes and it serves to call the attention of their parents to the subject and post them as to the needs of their children. He did not think there was any danger of this work being a help to the quacks. The mere fact that the profes-

sional men were doing the work, and were doing it unselfishly, would bring the parents to appreciate the difference between the professional and unprofessional dentists. The fact that we do not have the same children year after year is an advantage for us, as we will thus have more missionaries to carry the work on in the families. Oral hygiene does not benefit the teeth alone, for the sense of taste depends largely on the cleanliness of the mouth, while the health of the whole system may be and often is wrecked because of the lack of proper mastication due to imperfect teeth.

ORAL HYGIENE—REPORT OF COMMITTEE.

By Richard Grady, D.D.S., Baltimore. Read before the National Dental Association, at Milwaukee Aug. 6-9, 1901.

Two meetings were held at Old Point Comfort during the third annual session of the Association, at which a tentative plan was discussed and adopted. The task of communicating this plan to the state societies, and others, numbering fully one hundred, was entrusted to the Secretary, whose report, herewith submitted, will furnish statistical information. The Committee has been fortunate in having the gratuitous services of such an able Secretary, and wishes to take this opportunity to acknowledge the commendable zeal of Dr. Walker.

The suggestions toward popularizing oral hygiene have everywhere been received with favor. General knowledge of the causes of dental evils, the means of preserving the teeth by regular care, ought to form a part of the teaching of general hygiene in the schools. With the supporting influence of this National Association, and the mutual cooperation of the state and local societies with school boards, it is unquestionably true that children can be instructed in oral hygiene. The most important argument in favor of the examination of the mouths and teeth of school children is the educational benefit it would be to the community. Is it not the duty of the school to arouse society to intelligent thought on the importance of better modes of life? Is it not the duty of the school to train people to live better? Is not this the true purpose of the school? The logical place to begin this is with the physical life of society, the one phase of life that has been the most ignored by our educational methods.

The subject of instruction in oral hygiene in schools should

form a definite, systematically arranged series of topics discussed in such a way that children may be interested. Such a synopsis of a proposed text-book was presented to the Mississippi Dental Association, April, 1900, by Dr. Talbot, as follows:

Chapter I.—*The Oral Cavity.* General arrangements. The walls. The hard and soft palate. The upper and lower maxillae. The teeth. The tongue. The gums. The salivary glands.

Chapter II.—*The Maxillae.* Their development, structure, shape. Change of shape at different ages. Blood supply. Attachments. Articulation. The alveolar process.

Chapter III.—*The Teeth.* Their development. The calcification and decalcification of the temporary teeth. Shape of each. Their arrangement. Names. Time and order of eruption. Diseases attending eruption. Permanent teeth. Names. Shape. Articulation and arrangement. Time and order of eruption. Source of nutritive and sensitive supply. Arrangement of the enamel, dentin, cementum and pulp. Physical and chemical composition of enamel, dentin and cementum. The attachment of the teeth.

Chapter IV.—*Caries.* Predisposing causes: Faulty formation, manner of contact of proximal surfaces; hereditary influences. Active causes: Morbid condition of fluids of the mouth; mechanical abrasion; uncleanliness. Prophylactic treatment: Diet; mouthwashes; dentifrices: brushes; picks; silk; rubber; use of gum; tobacco; hygiene during dentition. Examinations. Fillings.

Chapter V.—*Calculus.* Salivary. Serumal. Alveolar. Abscess. Ptyalism.

Chapter VI.—*Odontalgia.* Local odontalgia. Reflex odontalgia. Reflex neuroses of dental origin.

Chapter VII.—*Antiseptics.* Disinfectants. Deodorants. Germicides.

Chapter VIII.—*Mastication.* Insalivation, etc., of food.

Chapter IX.—*Foods.* Those containing nutriment for the teeth and bones. When and how they should be taken.

Chapter X.—*Congenital Defectiveness and Deformity of Teeth.* Immediate causes of deformity, as, 1, deficient nutrition; 2, diseased nutritive fluids; 3, imperfect formative organs; 4, diseased formative organs. Influences modifying the development of the teeth, as 1, heredity, 2, civilization; 3, nervous disturbances; 4, diseases; 5, drugs and artificial diseases. Anomalies of the teeth

and maxillae, 1, excess of individual teeth; 2, deficiency of individual teeth; 3, multiple dentition; 4, lack of dentition; 5, anomalies of arrangement; 6, malposition of individual teeth; 7, imprisoned teeth; 8, anomalies in size, structure and shape; 9, advanced and retarded eruption.

Public schools are made use of to a greater or less degree for the dissemination of hygienic knowledge in most civilized countries. The thoroughness and the mode of instruction cannot be conclusively judged from the reports. Much has been done in this country for the study of "physiological temperance," as most states and territories have a temperance educational law which requires instruction in the danger of alcohol, but in many states the instruction is not limited to narcotics and stimulants. For instance, one physiology which has been translated into five different languages, with several hundred thousand copies published, teaches this: "The teeth should be examined that if enamel is removed and decay commenced they may be filled with gold foil. All amalgams, pastes and other cheap patent articles should be rejected, both for the sake of the teeth and the general health." The author of this school physiology must have heard of mercurial poisoning from amalgam fillings! Another, a primer intended for instruction of children in the schoolroom, by "one of the most skillful dentists of the country, enlivened by bright illustrations which children will enjoy," teaches "that milk is a good food, but it is better for the teeth after it has been boiled than when left uncooked"; that "our teeth will let us have all the eggs we want, but they like them best soft boiled"; that "we may have all the fish we want, say our teeth, if we only eat what is fresh and sweet"; that the "pretty red color of the cheeks and lips of the Irish is due to their habit of eating potatoes"; that "tartar affects saliva and makes food hard to digest"; that birds eat gravel and sand "to make their food digest"; and answers the question, "Why does a dog keep on gnawing his bone after the meat is all gone?" by saying, "He does it to keep his teeth clean and strong."

Greater efforts in behalf of disseminating oral hygienic knowledge in schools have lately been made in Alabama, where "the way is open to us"; in Florida where "the State Superintendent of Education is very favorably impressed on the subject"; in Illinois, where the Odontographic Society of Chicago has "sent circular

letters to the Boards of Education in all civilized countries in cities of one hundred thousand or over, asking them concerning such a movement, and gathering data upon the subject"; in Massachusetts, where "a committee of five has been appointed to investigate and report on the best method of getting at the condition of children's teeth in the public schools"; in Maine, where the subject has been discussed and a committee appointed; in Mississippi, where the matter is in charge of a special secretary; in New York, where the state society has appointed a committee of six, and its chairman, Dr. T. B. Hyatt, has already examined five hundred children in Brooklyn and reported results on blanks furnished by this Association; in Texas, where a committee from the medical society is working jointly with one from the state dental society; in Maryland, where a committee has planned for the examination of the mouths and teeth of school children, for talks to the students of the high schools on the care of the mouth and teeth, and for the aid of assistance in sterilizing instruments and in filling out examination blanks, and the Baltimore County Medical Association (as the result of a paper on the "Preservation of the Health of the Mouth") unanimously adopted a resolution recognizing the benefits of oral hygiene, approving the efforts to give instruction to pupils of public schools on the care of the mouth and teeth, and urging cooperation of boards of health and education in providing for detailed examinations and reports; in the Seventh District Dental Society of New York, where "the Committee is working to the end of having suitable matter inserted in the text-books"; in Virginia, where arrangements are being made for work in the fall; in Connecticut, where a committee has been appointed to confer with the school authorities; in the Duluth and Superior Dental Associations, where a committee has been appointed to go into the schools and make the examinations, two dentists for each city. From the District of Columbia Dental Society comes the word, "We shall be glad to obtain statistics for any number of examination blanks you may wish to furnish"; from the Galveston Dental Society, "Send the blanks and we will fill them out"; from the Toledo Dental Society, "The committee appointed by the local society has been waiting for some definite action by the National Dental Association giving rules and suggestions that we might all work on the same line, so send examination blanks and diagrams"; from Cedar Rapids Dental Society,

"Nothing of the kind has been done in this city, but we are willing to do it, if permission can be had from the school boards"; from Pittsburg, where Dr. Habeggar obtained permission from school directors of that city to make examination of children attending the Morehead School and examined three hundred and sixty-eight children. A significant fact in this report is, that out of fifteen hundred children in the school only nine refused to be examined.

The writings and addresses of professional men on the subject are familiar to you as readers of dental journals, so no quotations are noted in this report, but as evidence that the question is timely note some articles published in the *School Journal* of New York and the *Teachers' Institute* of Chicago, of which an editorial from the *School Journal* of Feb. 9, 1901, follows:

"*Care of the Teeth.* Physiology has become one of the fundamental studies in the elementary schools. In connection with it is given instruction in the simple laws of hygiene. Special attention is devoted to the evil effects of alcoholic beverages and narcotics. All this is commendable and encouraging to the friends of educational progress. The well-being of the body cannot be too highly regarded in the making up of school programs.

"One logical result of the more intelligent interest of the people in matters concerning the health of children is the introduction of expert medical inspection of the schools. Thus far this inspection has confined itself largely to the sanitary conditions of school buildings and the general health of pupils. If there has been any specialization it has been examination into the condition of children's eyes and ears, and perhaps also of the nose and throat. One important factor seems to have been largely disregarded, and that is the need of a periodical dental inspection. The principal reason for the oversight is probably to be found in the lack of interest on the part of the average physician in the health of teeth. This field has long been left entirely to the dentist, and the latter has not, at least in the United States, been made a member of the boards of medical examiners for schools. In Germany, France, Belgium, Sweden and Japan the importance of the examination of school children's teeth by a competent dentist has long received practical recognition. In Great Britain the question has been agitated for years, and all signs point to a speedy adoption of dental inspection and the teaching of the proper care of the teeth at least in city schools.

"The usual plan is to employ dental surgeons to make periodical examinations of every pupil. Records are kept and parents are advised concerning proper care, or free treatment is given to the poor. A similar system is very much needed in this country. State, county and municipal examiners of children's teeth must become a part of the public elementary school machinery.

"Meanwhile instruction in the care of the teeth ought to be made part of the elementary school course in physiology and hygiene. So much depends upon cleanliness and health of the mouth and teeth that the reasonableness of this proposition will be at once recognized. The decay of the temporary teeth may work lasting injury. Digestion is frequently impaired by imperfect mastication due to defective molars. The presence of microbes bred in particles of food left between the teeth is often the source of serious stomach troubles. Nervous difficulties of various kinds can be traced to neglect of the teeth. And the inference is by no means far-fetched, that the development of serious lung diseases has resulted from a neglected mouth. The wisdom of increased attention to the education of children in the things affecting their present and future health and strength is evident to every intelligent adult. No difficulty ought to be encountered, therefore, from the side of school officers in introducing lessons on the care of the teeth and mouth in the elementary schools."

ROOT-FILLING CLINIC.

REPORTED BY H. J. GOSLEE, D.D.S., CHICAGO, BEFORE THE NATIONAL DENTAL ASSOCIATION, AT MILWAUKEE, AUG. 6-9, 1901.

This proved a most interesting feature, showing the degree of success achieved, and the great variation of methods pursued by the operators. The canals of the teeth properly mounted were filled by the following: R. H. Hofheinz, S. C. G. Watkins, C. N. Johnson, E. K. Wedelstaedt, C. P. Pruyn, J. D. Patterson, L. S. Tenney, W. A. Johnston, M. L. Hanaford, H. L. Banzhaf, J. E. Keefe, J. W. Wassall, Elgin MaWhinney, J. J. Wright. Of the twenty-eight teeth so filled their subsequent dissection showed twenty practically perfect root fillings. The appended abbreviated record, in which the identity of the operator has been purposely lost, will prove interesting and show the results.

No. (Operator)	Result. (Designating Each Tooth.)		Method and Manipulative Procedure.			
			Cleaning and Enlarging.	Drying.	Lubricating Substance.	Filling Material.
	A.	B.				
1	Imperfect.	Perfect.	Gates-Glidden Drill and Twist Broaches.	Alcohol-Air.	Sol. Eucaylptus and Gutta-Percha.	Gutta-Percha Cones.
2	Imperfect.	Imperfect.	Twist Broaches.	Electric Drier.	Sol. Eucaylptus and Gutta-Percha.	Gutta-Percha Cones.
3	Imperfect.	Perfect.	Barbed Broaches.	Alcohol and Compressed Air.	Eucaplytus.	Chloro-Percha and Gutta-Percha Cones.
4	Perfect.	Perfect.	Barbed and Twist Broaches.			Oxychlorid Zinc, Gutta-Percha Cones and Amalgam.
5	Perfect.	Perfect.	Gates Glidden Drills and Barbed Broaches.	Hot Air.	Eucalyptus and Gutta-Percha.	Gutta-Percha Cones.
6	Imperfect.	Perfect.	Sulphuric Acid, Spiral and Barbed Broaches.	Alcohol and Hot Air.		Asbestos, Aristol, & Gutta-Percha Cones dipped in Chloro-Percha.
7	Imperfect.	Imperfect.	Sulphuric Acid, Spiral and Barbed Broaches.	Alcohol and Chloroform.	Oil Cajuput.	Chloro-Percha and Gutta-Percha Cones.
8	Perfect.	Imperfect.	Sulphuric Acid, Williams' Reamer and Broaches.	Alcohol and Air.	Eucalyptus.	Copper Points, Chloro-Percha and Gutta-Percha Cones.
9	Perfect.	Imperfect.	Broaches, Sulphuric Acid and Bicarbonate Soda.	Alcohol and Root Drier.	Chloroform.	Gutta-Percha Cones.
10	Perfect.	Perfect.	Sulphuric Acid, Ammonia, Barbed Broaches.	Compressed Air.		Chloro-Percha and Gutta-Percha Cones.
11	Perfect.	Perfect.	Broaches.	Alcohol and Air.	Eucalyptus.	Chloro-Percha and Gutta-Percha Cones.
12	Perfect.	Imperfect.	Sulphuric Acid, Broaches.	Alcohol and Air.	Eucalyptus.	Chloro-Percha and Gutta-Percha Cones.
13	Perfect.	Perfect.	Sulphuric Acid, Barbed Broaches.		Alcohol and Sandarac Varnish.	Copper and Gutta-Percha Cones.
14	Perfect.	Perfect.	Twist Broaches.		Alcohol and Sandarac Varnish.	Gutta-Percha Cones.

Digests.

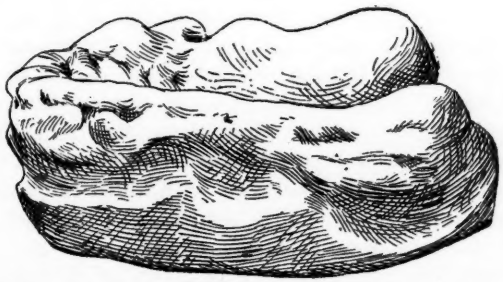
ALVEOLUS REMOVED. By W. R. Howard, D.D S., Newport, R. I. The opportunity presented itself to perform an operation, the occasion for which is rare, but which may be of interest. Last September a woman called at my office for treatment. Her teeth were in extremely bad condition, and there was obviously but one course to pursue, viz., extraction and insertion of artificial teeth. From the remains of her denture it was easy to judge what an unprepossessing appearance it must have presented at its best—the teeth being very small, with spaces of at least a quarter of an inch between the anterior ones. Consequently, it was but natural that she should be anxious to have the dentist improve on nature.

MODEL NO. 1.

I extracted the teeth and told her to return in six months, and she came according to instructions. I took an impression and started to make the upper denture, but on inserting the trial plate found it absolutely impossible to obtain any effect that could be tolerated, on account of the protuberance of the alveolus in the anterior portion of the mouth. I think anyone can get an idea of the impossibility of the case by a glance at Model No. 1. What to do I was at a loss to know, but it occurred to me that it ought to be possible and practicable to remove quite a portion of the alveolar process. I searched through reference books for a precedent, but could find none. I then consulted Dr. Brackett (Professor of Pathology at Harvard Dental School) and Dr. Darrah, a local surgeon of ability, and we decided that there could be no objection to the course I suggested, so we planned to carry it out.

The operation was done at the patient's home. She was laid on a long table and ether administered; then with a surgeon's knife I made a clean incision from cuspid to cuspid on a line with the natural position of the teeth clear through to the bone. Then with a periosteal elevator I pushed back the gum and periosteum, completely exposing the alveolar process for some distance both lingually and labially. With a pair of alveolar forceps I made an incision through the alveolus at the median line from a quarter to a half-inch in depth, and with that as a starting-point, using surgeon's bone-clippers, removed the alveolus to about the same depth to each of the cuspids. At Dr. Brackett's suggestion I had the dental engine at hand, with a variety of mounted carborundum

MODEL NO. 2.



stones, and found it but a few moments' work to grind smooth any roughness which remained after using the bone-clippers and which would have greatly retarded the process of healing. The gum was then replaced and trimmed, allowing a sufficient amount for shrinkage, and four sutures of catgut made to hold it in place.

I saw the patient the following day and she seemed to be progressing favorably, with very little soreness of the gums. I told her to return when it seemed to be thoroughly healed and free from tenderness, and to my surprise she was back in just two weeks from the day of operation. I proceeded to make an artificial denture without any gum in front, and succeeded to her complete satisfaction as well as my own.

Model No. 2 shows the mouth after operating, though the actual case ought to be seen to realize the great change that was made in her appearanee.—*International Jan., 1902.*

SMOKING AND EPITHELIOMA OF THE TONGUE. The question of the influence of smoking in the production of epithelioma of the lip has often been raised, and there is a general belief among surgeons that the use of tobacco is an important factor. Carcinoma of the tongue is fortunately a much rarer disease, and the influence of smoking in its production has not been frequently considered. In his latest edition of "Diseases of the Tongue" Henry T. Butlin states that he feels justified in speaking much more strongly on this subject than he ventured to do some years ago at the time of the appearance of the former edition of his work. He believes that smoking is a decided factor in the causation of cancer, not so much directly as indirectly, rather by producing or tending to produce these conditions of the surface of the tongue which predispose carcinoma than by immediately leading to the development of carcinoma in such tongues. He states that he does not rely so much on the statistics in support of this view as his personal experience with individual sufferers with precancerous conditions of the tongue and actual carcinoma. Thus Whitehead found only 61 smokers among 104 persons suffering from carcimona of the tongue, which seemed almost a small proportion, but the common history which we receive of much smoking, the great frequency with which carcinoma of the tongue is preceded by chronic inflammation of the surface of the tongue which has occurred in smokers and has been maintained by smoking, and the greater liability of males to the disease than females, leads to this view. Further confirmation of this belief is found in the fact that up to the present century but little attention was paid to the disease of the tongue. The introduction of tobacco in Europe at the end of the Middle Ages is thought to have had a great influence in the production to the disease.

Whatever influence tobacco may have in the production of carcinoma of the lip or tongue, it is exceedingly improbable that this fact will have much influence in preventing the habit of smoking. But, as Butlin suggests, it is probably more the irritation than any specific injurious quality of the tobacco itself. Hence smokers who would be wise should avoid the use of the stronger grades of tobacco, those forms of tobacco which to give aroma are mixed with various chemical and other substances which may be irritating, and the use of short stemmed pipes, and they should discontinue smoking the stubs of their cigars and cigarets until they burn the lips and

tongue. Those who have sufficient belief in the influence of tobacco as a specific factor in producing carcinoma can hardly have any other resort than to discontinue the habit.—*American Medicine.*

* * *

ANTRAL INFECTION IN DIPHTHERIA. Dr. Carolus M. Cobb of Boston, in a discussion before Mass. Valley Med. Assn., of the morbid conditions of the upper respiratory tract resulting from the infectious diseases, showed the relation of the infectious diseases to the chronic inflammatory diseases of the upper air tract; first, by an analysis of the reports of the autopsies held by Wolff and Richard Mills Pearce, and second, by an analysis of 102 cases of chronic nasal and post-nasal discharge which occurred in his service in the Lynn, Mass., hospital: Under the first of these analyses we find that Wolff has reported the results of bacteriological examination from the autopsies of 22 cases of diphtheria, 5 cases of measles, and 2 cases of scarlet fever. He found the antrum of Highmore involved in all the cases of diphtheria, and in many of the cases one or more of the other sinuses were also affected. The inflammation of the sinuses varied in intensity; in 15 of the cases it was severe, and in 12 of these the Klebs Loeffler bacillus was found; the other 7 were mild attacks caused by other bacteria. Three of the five cases of measles showed inflammatory changes in the antrum. Cultures showed streptococcus and pneumococcus in two cases and the staphylococcus in one. In one of the cases of scarlet fever the antrum and sphenoid sinuses were involved, and cultures showed staphylococcus pyrogenes aureus and the bacillus pyocyaneous. The other case showed no inflammatory changes and the cultures were sterile. Richard Mills Pearce of Boston City Hospital reports that he obtained cultures from autopsies of 39 cases of diphtheria, 2 cases of diphtheria with measles, 5 cases of diphtheria with scarlet fever, and 4 cases of scarlet fever. Inflammatory changes were present in 25 of the 39 cases of diphtheria. The number of the sinuses involved varied in the different cases, the antrum being the most often affected, i. e., in 16 of the 25 cases. Both cases of diphtheria with measles had double antral disease, diphtheria bacilli and streptococci being found in both antra in each case. Only 2 of the 5 cases of diphtheria with scarlet fever had disease of the accessory sinuses, but in one of these cases all of the sinuses were involved, and in the other the disease was unilateral. Cultures from one case

showed Klebs Loeffler bacilli and a variety of unrecognized bacteria; from the other streptococci and staphylococci. Inflammatory changes were present in the accessory sinuses in 3 of the 4 cases of scarlet fever. Cultures showed streptococcus and staphyloccus albus and aureus, and the bacillus pyocyaneus, and in one a short diplo-bacillus.

Under the second division the clinical manifestations of this involvement of the sinuses is shown by an analysis of 102 cases of nasal or post-nasal discharge which applied for treatment in the outpatient department of the Lynn, Mass., hospital. The whole number of patients was 243; of these 112 were adenoids and enlarged tonsils, 29 were nasal obstruction, and 102 were cases of nasal or post-nasal discharge. Only 17 of the cases of nasal obstruction complained of nasal discharge, and these are not included in the analysis. Of the 102 cases which complained of a nasal or post-nasal discharge without nasal obstruction, 31 had existed from childhood or did not know when it began, 25 followed influenza, 14 followed diphtheria, 11 followed repeated colds, 6 followed scarlet fever, 7 followed measles, 4 followed typhoid fever, 2 followed pneumonia, 2 followed whooping-cough.

This conception of the catarrhal inflammations of the upper air tract places them in a new light and leads to a reasonable hope of their successful treatment. The paper should be read in full, as it is a thoughtful presentation of question.—*Med. Mirror.*

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NERVOCIDIN. By Theodore Söderberg, D.D.S., Sydney, N. S. W. As tabulated statistics of clinical experiments with nervocidin have already been published, I shall limit my contribution to a few general remarks (purely empirical) on my clinical experience with the drug. The remarkably quick action of nervocidin is perhaps the first point observed. In many cases of exposure the pulp can be painlessly extirpated after a few hours' application of the drug. The next point observed is that nervocidin has not the deeply penetrating quality of arsenic. In most cases of non-exposure two applications are required to sufficiently anesthetize the pulp prior to extirpation, the first being for the painless exposure of the pulp, the second for its removal. Another point soon noted is the long duration of the analgesic effect of nervocidin. Not being a caustic or an escharotic, it acts on the pulp in a totally different way from arsenic.

Arsenic devitalizes, nervocidin anesthetizes or paralyzes the tissues. Clinical proofs: Seal an arsenic dressing for twenty-four hours over a freshly exposed pulp; result, devitalization beyond resurrection. Seal a nervocidin dressing similarly; result, *apparent* or partial death of pulp. Remove dressing and all traces of nervocidin; seal a eugenol dressing over exposure for a week; result, pulp highly sensitive. Again, seal an arsenic dressing forty eight hours in the shallow, hypersensitive buccal cavity of a lower molar; result, (1) death of the contents of tubuli, with (probable) ultimate death of pulp; (2) sloughing on cheek in contact with the seal. Seal nervocidin similarly; result, hypersensitiveness gone and no sloughing on cheek. Now excavate freely and fill cavity for a week with a zinc oxid-eugenol filling; result, return of sensitiveness of dentin.

Until otherwise convinced, my opinion is that nervocidin acts paralytically on the nerve fibrils. Can, then, nervocidin be fearlessly used as an obtundent for sensitive dentin? Perhaps it can and perhaps it cannot; time alone can answer that question. All I can add to the above opinion is the advice to those practitioners who dare the experiment to carefully choose their test patients, and then proceed as follows: Mix oxysulfate (or oxyphosphate) to medium thickness, and incorporate with it a small quantity of nervocidin. Dry the sensitive cavity with bibulous paper, and insert the filling. From two to forty-eight hours after (according to experiment) remove cement, excavate, and fill permanently. *Watch that tooth!*

Does pain follow the application of nervocidin? My experience so far is that some pain generally follows in cases of acute pulpitis, but the pain is not nearly so constant and severe as that felt after the immediate application of arsenic in similar cases. Where acute pulpitis is absent pain does not as a rule follow. In two cases I found, however, tenderness to occlusion after the fourth day—why, I cannot explain satisfactorily, as nervocidin, unlike arsenic, does not cause hyperemia of the pulp, and does not appear to be a sufficiently strong irritant poison to produce a toxic periodontitis similar to that often produced by arsenic after its retention in the cavity longer than forty eight hours. After fully exposing the pulps in these two cases (both upper and third molars), I found the color to be a light pink, and no trace of septic infiltration present; hence neither hyperemia nor gas formation could account for the tenderness. Nor did the seal interfere with proper occlusion.

As nervocidin does not cause hyperemia of the pulp, its use for the anterior teeth should be indicated in preference to arsenic, with its concomitant discoloration of those teeth. *In all cases of pulp-extirpation or amputation where the decay extends beyond the gum-margin or where the seal comes in contact with the oral tissues, nervocidin must in the future be substituted for arsenic.* This statement I consider unassailable. The relative value of the two drugs in all other cases of devitalization, extirpation, or amputation of pulps is open to discussion. I personally give the preference to nervocidin in ninety per cent of all cases. Its sticky nature when moist renders it difficult to place in position per medium of absorbent materials, such as cotton-wool or spunk. A non-absorbent medium should be used, the under surface of which is moistened just sufficiently to take up the quantity of nervocidin, the dry upper surface being gripped by the pliers. It is preferable to have the cavity as dry as circumstances will allow, thus allowing a more reliable seal to be made. The introduction of nervocidin is one of the greatest events in modern dental pharmacology.—*Cosmos, Dec., 1901.*

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TRAUMATISM OF PHARYNGEAL AND LARYNGEAL MUCOUS MEMBRANES. Among the many interesting features of the investigations which have been carried on by Crile of Cleveland for the past few years, are those observations upon the inhibitory effect upon the respiratory and circulatory apparatus attending traumatism of the pharyngeal and laryngeal mucous membrane. In his studies of the pathogenesis of shock Crile has paid particular attention to the effect of trauma in different regions and tissues upon the blood pressure, and of particular interest were the results attending traumatism inflicted upon the mucous membrane of the larynx and pharynx. It was found that the subjection of the mucosa of the larynx or pharynx to any insult always had an inhibitory effect upon the respiratory and sometimes upon the cardiac apparatus, the upper or superior portion of the larynx being particularly sensitive. These inhibitory messages were proven to have been transmitted through the superior laryngeal nerve, as upon section of this nerve these inhibitory phenomena were not exhibited. The sudden deaths attending the introduction of the intubation of the tracheotomy tube may, according to Crile, be accounted for in this way. Many a surgeon can recall one or more occasions in his experience when sudden

death from respiratory failure, not from asphyxia, immediately followed the introduction of the tube. In some cases the anesthetic was held at fault, in others it was said that the tube had become plugged with a piece of membrane, and in other ways attempts were made to account for this sudden and fatal complication. Just at the time in which relief to the already partially asphyxiated subject is at hand, sudden death robs the surgeon of a recovery that seemed assured. That these deaths are not due to asphyxia will be admitted if one but stops to think of the clinical picture, noting particularly the almost instantaneous interruption of the respiratory act in sudden death from respiratory failure, which contrasts strongly with the increased respiratory efforts, lasting several minutes, by which the subject with asphyxia attempts to overcome the effects of obstruction to the ingress of air. If one could anesthetize the mucous membrane of larynx or pharynx before the introduction of the intubation or tracheotomy tube, or in laryngectomies before attacking the larynx itself, there is reason to believe that this complication could be averted. To this end Crile has introduced into his technique of this operation the complete anesthetization, by the infiltration method, of the tissues of the larynx.

The results of investigations upon the pharynx would seem to condemn the practice of vigorously swabbing out the fauces during ether narcosis. This is a practice which no doubt is justified in certain instances, as, for example, when the collection of mucus is large enough to embarrass respiration. We are inclined to believe, however, from our observations, that it is resorted to much more frequently than necessary, and in such instances it should be regarded as a mischievous practice. If, as Crile reports, vigorous traction of the tongue likewise produces reflex inhibition of the respiratory function, some caution should be observed in the restoration of patients by the rhythmical traction of the tongue. So, too, in those cases in which, in its relaxed state, the tongue falls back into the pharynx, the anesthetizer should be mindful of this possible inhibitory effect and should not apply the tongue forceps needlessly, nor make too vigorous traction upon that organ.—*Phila. Med. Jour.*

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CARBOLIC ACID AND CREOSOTE WITH ALBUMIN. By Joseph L. Mayer, Ph.D. Among the tests for carbolic acid given in the United States Pharmacopeia of 1890, we read that on adding

this "acid" "either to albumin or collodion coagulation takes place (difference from creosote)." In the "Digest of Criticisms" perpared by the revision committee of 1890 we find the following in reference to the pharmacopeial statement as to distinction from creosote: "This is certainly an error; it is creosote which coagulates albumin." In an endeavor to dissipate the uncertainty thus created in his mind, the writer thoroughly read the literature pertaining to the subject, and supplemented this by practical work, with results which follow. The only part of the pharmacopeial paragraph in doubt is that which had to do with the action of albumin or creosote, as the wording of the inference implies that carbolic acid and not creosote coagulates albumin. It was natural to expect then that under the article on creosote we should find a statement something like, "Does not coagulate albumin (difference from carbolic acid)," but such a statement is absent from the Pharmacopeia. Then came the thought that perhaps an earlier Pharmacopeia would reiterate its assertion made under carbolic acid, and say under creosote that it differed by not coagulating albumin. The 1880 edition rewarded the search; in addition to the notes on carbolic acid, which do not differ from those of the 1890 one, there appeared under creosote: "Creosote does not coagulate albumin." Why the present book should go only half-way is not apparent.

The new "United States Dispensatory" (eighteenth edition, August, 1899), under methods of distinguishing carbolic acid from creosote, says, "Creosote is distinguished by not coagulating collodion or albumin." To practically test the worth of these variously couched statements that creosote does not coagulate albumin the following tests were made: The white of an egg was taken, and after being thoroughly cut into small pieces with a pair of scissors (to aid solution) was thoroughly shaken with about twenty per cent of water to dissolve the albumin, and filtered; this solution was used throughout. The creosote used was Merck's beechwood variety of the highest purity, which withstood all the tests and did not in any way respond to any reactions for carbolic acid except the albumin one to be described. Two kinds of carbolic acid were employed. One a very pure natural product, and the other a pure synthetic article. The tests were carried out in three-dram cork-stoppered homeopathic vials, as they were more convenient to shake and handle than test-tubes. The carbolic acid had added to it just

sufficient water to keep it in a liquid state; the conditions as to quantities, etc., were alike throughout, and the number of tests aggregated about sixteen.

In every case where creosote and albumin were mixed the mixture almost immediately coagulated, that is, formed a mass so gelatinous that it could be cut with a knife. The natural carbolic acid and albumin formed a liquid with white flocculi, and the mixture remained mobile for at least four days before gelatinizing. The synthetic carbolic acid and albumin formed a very fluid mixture which showed but a few flakes and did not at first give any evidence that it would ever gelatinize, but after six days it did so, becoming thick and solidified, but at no time did any of the carbolic acids act like the creosote and thicken or solidify at once. As a result of this work the writer would call the attention of the new committee of revision to the carbolic acid test as it now rests, suggesting that it be changed to "Coagulates collodion (difference from creosote)," and then on a distinct line say, "Coagulates albumin." It should go farther and under creosote say the same—viz., "Coagulates albumin." It would discredit the fallacy that the coagulation of carbolic acid by albumin is a means of differentiating between carbolic acid and creosote, for as both behave in exactly the same manner towards albumin, the test becomes one of identity (when associated with others) rather than of differentiation.—*Merck's Report.*

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NOVEL THEORY OF CANCER. An Australian physician, J. H. Webb, offers a theory of cancer that will be novel to a majority of the profession. He rejects the parasitic theory that has lately been so prominently to the fore, holding that thus far no sufficient evidence has been adduced to support it. Nor does he look to the microscope for the solution of the question of the origin of malignancy—"all the microscopes that were screwed up and down could never have revealed to us the connection between myxedema and the thyroid gland—one of the most important discoveries made in recent years." Supposing, he says, myxedema had been only recently recognized and our knowledge of the function of the thyroid still witheld, what a search there would have been after its germs! Taking what clues we have to the disease, he sees little to favor the irritation theory of the excitation of the irregular cell proliferation and much more to suggest a secretory derangement. All secre-

tions, he postulates, have their uses, and the plus or minus of any secretion beyond certain limits means disease. All reproduction requires control, or, given nutrition, it would be indefinite. There must therefore be something that limits the proliferation of the cell, and on account of its variability he thinks it can be only a secretion, which may be disordered in nature or in its control. If inhibition is lost and food supply continues proliferation becomes indefinite; hence there must be something in the organism that regulates the multiplication of the cell.

Cancer is the uncontrolled proliferation of one of the two ultimate tissue elements—cells and fibres. If one of these can lose its control it stands to reason, he says, that the other can do the same, and we find this in myxedema, which is uncontrolled proliferation of the fibre. We know that myxedema is due to defect of the thyroid secretion, and by analogy we should expect to find somewhere in the economy a similar body controlling cell proliferation, though the conditions are not exactly the same, since the cell, like a flask, can contain its own control. Reasoning thus, Webb turns to the liver secretion, the coincidence of gall-stones and malignancy, and our ignorance of the real function of the liver secretion suggesting the analogy. Mayo Robson and others have noticed this coincidence, and some have written of cholesterin irritation in the causation of cancer. Cholesterin, which Webb at first believed to be the controlling agent of cell growth, is isolated only in its crystallin state, that is, when it has become a morbid product. In the organism it is in solution and is kept thus by its own solvent soap. Under this impression, that cholesterin was the controlling agent and had become deficient, he tried injecting it hypodermically in cancer cases in solution with soap, at the same time administering thyroid. Later he has apparently used soap solution alone with the thyroid, and he reports some striking results as well as frankly acknowledges some failures. He reports two cases of epithelioma as cured and two more strikingly relieved; also one case of scirrhus of the breast and one of rodent ulcer cured. The cell element first disappears under the treatment, leaving the fibrous tissue behind, to be absorbed later.

It is not the lack of cholesterin that causes cancer, according to this theory; its crystals can be isolated from cancer discharges; it is the want of the saponifying agent in Webb's opinion, and he

thinks it is one of the functions of the liver to produce this. Both the ultimate elements, fibre and cell, enter into cancer, hence the use of the thyroid. The cell, it may be from an injury, "sheds its cholesterin, and the succeeding offspring acquire the habit," and this is where Adami's "habit of growth" hypothesis comes into play.

Whatever may be thought of this theory of the pathology of cancer, if Webb's diagnoses can be relied upon, and their apparent lack of pathologic verification suggests a possible doubt, the results reported by him are worthy of consideration in a disease that is so generally resistant to our best efforts. Any therapeutic suggestion that is not itself deadly is at least worth investigation in such an almost universally hopeless disease.—*Jour. Am. Med. Assn.*

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HEREDITY, WITH SPECIAL REFERENCE TO THE DIMINUTION IN SIZE OF THE HUMAN JAW. By J. Sim Wallace, M.D., D.Sc., L.D.S.R.C.S., London. That the human jaw is gradually becoming smaller is a fact which is universally recognized, but the cause of this diminution in size is not so very apparent. By those who believe in the transmission of acquired characters it is instanced as a case in support of their view. By those who deny this inheritance of acquired characters it is assumed to be explicable according to the principles they maintain; although, so far as I have seen, there has not as yet been an adequate explanation of the fact by them.

Before entering upon the discussion a few facts and figures may be useful. The size and prominence of the jaws may be indicated by Prof. Flower's gnathic index, which is well known, viz.: Basi-Nasal line x 100; Basi-Alveola line =gnathic index, or shortly B.-N. x 100; B.-A. =gnathic index. The following may be taken as examples: Prognathous, Native Australian. Gnathic index 104. Mesognathous. Chinese. Gnathic index 99. Orthognathous. English, Gnathic index 96. This gnathic index gives the relative sizes of the jaws to the head, and we need not concern ourselves with the absolute measurements. In the present inquiry the size of the jaws relative to the skull is of chief or sole importance. Another set of measurements which are perhaps less generally known is what Prof. Flower calls the dental index; that is, the relative length of a line taken from the posterior surface of the

crown of the third molar to the anterior surface of the crown of the first bicuspid (in the upper jaw) and the length of the basi-nasal line. If the former line be represented by *d*, the dental index will be as follows: d x 100 B.-N.=dental index. This index gives the sizes of the teeth relative to the general size of the skull perhaps better than any other measurement which may be devised. As instances the following may be taken—Microdont. British. Dental index 41.3. Mesodont. Chinese (male). Dental index 42.6. Megadont. Australian. Dental index 45.5. The basi-alveolar line is about 2 1-3 times the length of the dental line; and if we multiply the dental index by that number the result is approximately the gnathic index, i. e., the diminution of the dental and gnathic index is approximately identical. Thus, English 41.3 x 2 1-3=96.3. Gnathic index 96. Chinese 42.6 x 2 1-3=99.4. Gnathic index 99. Australian 45.5 x 2 1-3=106.1. Gnathic index 104. To be somewhat more exact from the figures, it will be seen that the dental index diminishes rather quicker than does the gnathic index. This does not support the belief that the jaws diminish in size more quickly than the teeth. It might on *a priori* grounds be assumed that the size of the body of the jaws is directly correlated with the size of the teeth, and this we see is actually the case.

If now we compare the *position* of the teeth in prognathous races with that of orthognathous races, we observe that they are placed somewhat differently. A figure drawn from Owen's Comparative Anatomy and Physiology will show at a glance the more anterior position of the dental arch in the aboriginal Australian. It will be observed that prognathism is dependent on the prominence of the alveolus in the incisor region, on the more forward direction of the incisors, on the size of the body of the jaw, and on the more anterior position of the arches of the teeth relative to the body of the mandible and the bones of the face. Besides the differences already mentioned there is a considerable difference in civilized and savage races in the shape and especially in the massiveness of the mandible, due largely to the effects of muscular attachments and actions.

From the continued use of coarse and fibrous foods in savage races the muscles of mastication are greatly augmented in size. The amount of difference in this respect between the uses of the civilized and the uncivilized may be judged from the recent experiments

of Dr. Black, who finds that man living on "natural food would be able to close his jaws with a force of three hundred pounds, whereas in a civilized state and depending upon artificial preparation of foods the amount of stress that would be borne by the individual tooth without severe pain or injury is reduced to one hundred pounds or less in a state of apparent health."

A comparison of an aged jaw in which the teeth are lost with one in which the teeth are in full functional activity shows at a glance the parts of the mandible which are chiefly augmented by muscular development. The subserviency of the alveolus to the teeth is also seen. It will be seen that a large part of the angle of the jaw has been absorbed, and the anterior condyle is reduced in size. Not only are the changes shown in the figure brought about, but the massiveness of the jaw is reduced by at least one-half. A similar change is observed in those parts in the neighborhood of the insertion of the masseter, temporal and internal pterygoid in childhood and adolescence. That is, with the increase in size and strength of the muscles there goes an increase in length, breadth, and depth of the ramus, and this change takes place in proportion to the muscular development. It may be noticed that in the aged jaw the length does not diminish, and as I have said before, the length of the body of the jaw is largely dependent on the development and size of the teeth.

We are now in a position io point out the causes of the diminished size of the civilized jaws. There are three principal causes. (*a*) Diminution from muscular inactivity, or as it might be put with stricter accuracy, incomplete development from lack of the necessary stimulus of muscular activity. (This diminution is in bulk not in length, as above pointed out.) The incomplete development from this cause is of course generally recognized, not only in the case of the jaws but in all bones to which muscles are attached. The increased development from muscular activity is chiefly in the neighborhood of the attachments of muscles. It is difficult to say to what amount the jaw-bone might develop in the civilized races were it subjected to the muscular strain which is normal among savages. and, as this may be considered a point or the point at issue, it will perhaps be well in the meantime to limit our attention to what actually does take place. The comparison between the old and young jaw shows this sufficiently clearly. In

addition to the stimulus to growth of muscular activity we may add that of increased strain. It is known that the arrangement of the trabecula in long bones is due to the direction of strain, and this force no doubt influences slightly the development of the jaw.

The next cause of diminished prognathism in the civilized is (*b*) the more posterior position of the whole arch of the teeth, due to the diminished size of the civilized tongue. When the mouth is closed the tongue fills the cavity of the mouth, and thus the size of the arch of the teeth gives a fair indication of the size of the tongue. Measurements have been taken of numerous skulls, and a marked diminution in size in the civilized has been observed. It is well known that the position of the teeth is easily changed by mechanical means; if a slight continuous force is applied to any or several teeth they are moved till the pressure is equilibrated by an equal and opposite force. The whole system of the regulation of the teeth employed by dentists is dependent upon this fact. If a tooth or teeth are thus made to alter their position the alveolus adapts itself to the changed position. Since this is the case it is impossible for the teeth to be other than prognathous when the tongue is large, or vice versa. The question as to the cause of this enlargement of the tongue is simply that it, like other muscular structures, when it is much used develops more fully. I have pointed out elsewhere how very much more the tongue is used when coarse and fibrous food is masticated than when the refined foods of civilized peoples are masticated or swallowed. However, whatever be the cause of the diminished size of the tongue, the fact undoubtedly remains that it is smaller and that the teeth and alveolus occupy a position which is largely dependent upon its size.

The third principal cause of the smallness of the civilized jaw is (*c*) the size of the teeth themselves. That the teeth of the civilized are smaller than are those of the more savage races is established by actual measurement. The crowns of the teeth are developed in the substance of the jaw-bone, and it is known that the active development of surrounding parts is thus stimulated to growth. This is remarkably verified by cases in which the number of teeth is reduced in number. It is evident that this stimulus for the development in length of the body of the jaw is independent of muscular activity. It is important to observe that the teeth of the civilized have diminished in size, as they are passive structures, are formed

quite independent of use, and do not augment in size by functional activity. Nor is it maintained by "transmissionists" that such diminished size can be held to be due to inheritance of acquired characters. Thus Mr. Spencer, in referring to spines and other structures in plants whose functions are passive, says that this evolution is inexplicable except as results of natural selection. So, too, with structures having only a passive utility in animals he says he "never dreamed" that they were explicable as the result of the inheritance of functionally wrought modifications.

The diminution in size of the teeth by natural selection, however, presents a somewhat difficult problem. It may be questioned by some whether slightly smaller size of teeth can possibly have been of sufficient survival value to have caused the extinction of multitudes of men, and so to have brought about a diminution in the average size of civilized teeth. When we consider merely the extra weight of larger teeth, and the extra nutrition and muscle required to carry them about, we should certainly come to the conclusion that this has not been the cause of the diminution. It is not, however, always in a direct way that changes are brought about. Consider for example the case of such savages as the Australians. In them we find a relatively small cranial capacity, 1,197. Compare this with the cranial capacity of an Englishman, viz., 1,427. Remember that the cranial capacity of the remote ancestors of the English was no larger than that of Australian, and we see that assuming the size of the teeth to remain the same while the cranium increases in size, we have a certain advance towards the microdont type, for the basi-nasal line may be assumed to augment with the general augmentation of the cranium. The survival value of increased brain capacity will hardly be questioned.

Consider the matter from a slightly different point of view; assume that it is of considerable survival value that the brain of man should be highly developed and well nourished. A certain amount of nutrition flows along the common carotid; in one case let us assume that a larger amount is diverted to the cranium, and that this develops fully; in another that a larger amount goes to the teeth. It is evident that if the brain is of great survival value the teeth may suffer, those inheriting the one peculiarity surviving, while those inheriting the other become extinct. This latter assumption I have introduced more to indicate how indirect methods may effect

a diminution in size of the teeth rather than as an actual statement of fact as to the exact method which has in reality taken place. In addition to the factors which directly or indirectly may bring about a diminished size of the teeth, we may also have the factors panmixia and germinal selection.

Now what does all this indicate with regard to the size of the savage and civilized jaw? Simply that to a great extent its particular size is not due to heredity, but is largely a characteristic redeveloped in each generation as the result of the action of the environment, This is quite in accordance with the recent investigation of biologists. "Botanists and zoologists have conclusively shown that the bodies of animals and plants are subject to a very great change as the result of changes in the environment. Such changes are, indeed, not inherited, at least as a rule, but are simply redeveloped in each generation as the result of the action of the environment. Specific characters we have supposed to be inherited, but the more this matter is studied the more prominent has become the question as to whether most of the so-called specific characters, instead of being matters of inheritance, are not simply acquired by each individual." Much more strongly does this emphasize the fact that racial differences frequently are almost solely dependent on differences of environment.—*Dental Record, Dec., 1901.*

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EARLY EMBRYONIC DEVELOPMENT AND THE FORMATION OF THE MOUTH AND NOSE CAVITIES. By F. B. Noyes, D.D.S., Chicago. Read before the Chicago Odontographic Society. Our present knowledge of embryology has been acquired during the last half of the century just closed and is one of the results of the development of the cell theory. If we go back into the seventeenth and eighteenth centuries we find the most fantastic notions of development, all of which were purely speculative and necessarily so, for the means of investigation had not been developed in the higher forms of the microscope, and these fantastic notions were dispelled only by the improved means of observation. The subject as it stands today has been one of the phases of the development of the cell theory and we may well look to the development of thought in this line of biological study as an introduction.

Since the time of Schleiden and Schwann, who in 1839 announced the cell theory, a vast amount of work has been done, at first in the

analysis of the bodies of plants and animals, studying the forms and origin of cells making up the tissue, and later in the study of the functions and activities of the cells and their importance in inheritance and transmission.

We can perhaps not do better than to make a somewhat extended quotation from Prof. Wilson as a statement of the cell theory. He says (Introduction to "The Cell in Development and Inheritance"): "In all the higher forms of life, whether plants or animals, the body may be resolved into a vast host of minute structural units known as cells out of which directly or indirectly every part is built. The substance of the skin, of the brain, of the blood, of the bones or muscles or any other tissue, is not homogeneous as it appears to the unaided eye. The microscope shows it to be an aggregate composed of innumerable minute bodies, as if it were a colony, or congeries of organisms more elementary than itself. These elementary bodies, the cells, are essentially minute masses of living matter or protoplasm, a substance characterized by Huxley many years ago as 'the physical basis of life' and now universally recognized as the immediate substratum of all vital action. Endlessly diversified in the details of their form and structure, cells nevertheless possess a characteristic type of organization common to them all, hence in a certain sense they may be regarded as elementary organic units out of which the body is compounded.

"In the lowest forms of life the entire body consists of but a single cell. In the higher multicellular forms the body consists of a multitude of such cells associated in one organic whole. Structurally, therefore, the multicellular body is in a certain sense comparable with a colony or aggregation of the lower one-celled forms. From the physiological point of view a like comparison may be drawn. In the one-celled forms all of the vital functions are performed by a single cell. In the higher types they are distributed by a physiological division of labor among different groups of cells specially devoted to the performance of specific functions. The cell is therefore not only the unit of structure, but also the unit of function."

In the earliest work Schwann regarded the cell wall the important part and the soft substance contained in it as a waste product, because in important plant tissues such as wood it entirely disappears, leaving only the lifeless walls. Hugo von Mohl gave the name protoplasm to this soft subtance; Kölliker, Cohn, Max

Schultze and others showed that the protoplasm was the essential part, as many animal cells—for instance, the white blood corpuscles, have no cell wall, and they also showed that the protoplasm contained within it a smaller vesicular body called the nucleus. In later years the knowledge of cell structure has advanced still farther, it being known that neither the protoplasm nor the nucleus are simple and final substances as they were supposed to be, but that they are, both chemically and structurally, complex. The nucleus is found to be made up of at least two chemically different substances, one of which, called the chromatin, combines with certain analin dyes, showing the color, while the other, the achromatic, does not, but remains colorless.

By experiments with single-celled forms it has been shown that if the nucleus is removed from a cell it may continue to live for a time, the destructive changes going on in its protoplasm, but it will not assimilate food material, it will not grow nor divide, and sooner or later will die. It was also shown that when constructive changes are going on in the protoplasm of the cell, as in secretion of gland cells, there are also changes in the nucleus; and cells whose protoplasm is active contain large nuclei, often of complicated form, while those whose protoplasm is inactive contain small and vesicular nuclei except during division. From these and many other facts it may be stated that the nucleus exerts a controlling and directing influence over the constructive functions of the cell and its division.

The knowledge of the relation of the nucleus to the protoplasm has been still further developed, with the advancing knowledge of cell division. Cell division, as at first described by Remak and Kölliker, was a simple process consisting only in the division of the protoplasm and the nucleus, both of which they conceived to be simple substances, and could be described as the stretching in two of a lump of jelly. This division was more or less hit or miss and uncertain as to the parts received by the offspring from the parent cell. It was not until a much later time that the cell was shown to possess a complete mechanism for the exact and systematic division of the substances of the protoplasm and nucleus of the parent to the resulting cells. It required many years of labor to correct the mistaken notion of the enunciators of the cell theory, that the cells of the body may arise in development from a primitive and

structureless substance which they called the "primitive blastema," and prove the hypothesis clearly stated by Virchow in 1855, that every cell is derived by division from preexisting cell, making a complete line of cell divisions back to the single cell of the parent organism.

The later studies of cell division have shown that the chromatin of the nucleus, which in the functioning condition of the cell is usually arranged in the form of a network, in cell division first forms a continuous thread which shortens and thickens and finally breaks up into short "U" or "V" shaped pieces called chromosomes, which arrange themselves at the equator of the nucleus with the angle toward the center. The chromosomes then split lengthwise into similar halves and one-half moves toward one pole of the nucleus and the other to the other pole where separate nuclei are formed, the protoplasm dividing at the same time. This shows the beautiful mechanism for the distribution of the chromatin to the resulting cells, the importance of which is realized when we remember that this chromatin is to superintend all of the functions of the resulting cells, controlling the formative activities.

It has been shown that the number of chromosomes appearing in the cells of an organism in their division is a characteristic of the species and constant in all the cells of the body, and always an even number. And further, that the number of chromosomes in the germ cells is always half that of the cells of the body, so that in fertilization by the union of male and female cells (which constitutes fertilization) half of the chromosomes are of male and half female origin. These split longitudinally so that the two cells resulting from the first division of the ovum contain the full amount of chromatin equally derived from the male and female parent. These observations obtained in the working out of the cell theory furnished the demonstration of the evolutionary idea that the two sexes are equal in inheritance.

In all of the further development of the individual we must remember that the chromatin is to control the development and activities of the cell and by this mechanism of cell division called karyokinesis is systematically distributed, sending that which is to develop nerve cells to one part, that to develop muscle cells to another, so coordinating the development of various parts that when we see the development of the enamel-forming organ from one set

of cells we see at the same time the development of the dentin-forming organ from another set.

It would lead us too far and require too much time to develop all of the steps in the growth of biological thought which have brought the cell theory and the evolutionary theory together and which lie at the foundation of modern ideas of inheritance and transmission. I have endeavored to bring out enough to show that in the development of the individual there is a continuous multiplication of cells and a progressive differentiation, but all changes are systematically executed under a special mechanism. In this development from a single cell we will see that the individual passes through successive stages which correspond to the steps the race has passed through in its development, or ontogeny repeats phylogeny.

The fertilized ovum is a single cell, but it contains that which determines the entire development and all of the functions of the adult organism. It may therefore be compared to the single-celled animal, and at this stage the individual may be said to be in the ameba condition. This single cell divides into two, then four, then eight, and so on, and these divisions take place in a definite way, constituting the process known as segmentation. The cell being more or less spherical, the first division occurs as if by a plane passing through both poles dividing it into hemispheres, the second also through both poles at right angles with the first divides the hemispheres into quadrants, and the third at right angles with the other two, in a position corresponding to an equator divides the four cells into eight. This goes on, the lines of division following regular geometrical laws until the single cell is converted into a spherical mass of cells not very much larger than the original ovum.

In development, as might be expected, we find differences in various classes of animals. While they all follow a similar development up to their degree of perfection or specialization, in one certain evolutionary steps are most marked and recognizable, in others different stages are more clearly seen. In some animals, as in the chick, the ovum is provided with a great amount of nutriment material, so that the active protoplasm really floats on a sphere of non-living matter. In others, as the frog, the egg contains much yolk, but only enough to make the cells around one pole after the first few divisions much slower in division and so much larger than those around the other, leading to the first differentiation of cell form.

In man we find a similar condition, so that after the first few divisions the cells of the upper pole divide much more rapidly than those of the lower, and grow down over the others, inclosing them. When the large cells have been entirely covered in by the small ones, the latter continue to multiply more rapidly and fluid collects inside the sphere, leaving the large cells adhering to the inner surface of the small cell layer at one pole of the sphere. At the upper pole where the sphere is made up of two layers of cells there is an opaque spot or the "area pellucida." from only part of which the embryo is developed, the rest forming organs to provide it with nourishment during the embryonal condition.

Starting from the center of the opaque area on the upper surface of the sphere or blastula, there appears a streak known as the primitive streak, caused by the appearance of a rod of cells lying between the two layers, and from the side of this rod or notochord a third kind of cell different from either the large or small cell layer is formed. These three kinds of cells make up the three layers of the blastoderm and represent the first step in difierentiation; or to state it in a different way, all of the chromatin which directs nerve cell activity has been sent to the outer small cell layer or epiderm, all of the chromatin which directs muscle cell activity, etc. has been sent to the new cells of the third layer or mesoderm, while the large cells of the inner layer or hypoderm contaiu chromatin to direct most of the secretory activities and the formation of the epithelium of the alimentary canal.

The epidermal cells on either side of the primitive streak grow rapidly, forming two ridges with a groove between them, which grows deeper and deeper until the ridges bend over and join, inclosing a tube which is to be the canal of the spinal cord. The anterior end of this tube enlarges into three bulbs which correspond to the ventricles of the brain, and as they increase in size they fold over ventrally or toward the center of the sphere till the first and second are at right angles to the original tubular part. As the outer layer forms the tube of the central nervous system, the inner layer folds off the blind pouch from the general cavity of the sphere which is to form the anterior part of the alimentary canal. By this time development is complicated by the formation of the embryonal membrane the amnion and allantois, but we may omit these entirely for our purpose.

The diagram from Quain's Anatomy illustrates the condition just described, showing the embryo in longitudinal section, the bending over of the anterior end of the neural canal to form the mid and fore-brain and the fore-gut or esophagus, a blind pouch ending anteriorly under the mid-brain and posteriorly opening into the cavity of the sphere now called the yolk sac. This pouch is lined by hypoblast and covered by mesoblast and epiblast. The heart has already begun its development in the mesoblast on the ventral side of the fore-gut.

There now appears what are called the gill slits, openings from the fore-gut through its wall to the surface of the embryo, which are separated by thickenings of the wall, forming arches around the gut known as the visceral arches, at the center of each of which is found a blood vessel. These structures are to be compared to the gills of a fish, which are slits through the wall of the esophagus to the outside so that water taken into the mouth may pass out through the slits. At this time, too, the arrangement of the blood vessels exactly resembles that of a fish and the individual may be said to be in the fish stage of development.

Quain's Anatomy and Hertwig's "Text Book of Embryology" show the embryo at this stage and the arrangement of the blood vessels. As the fore-brain grows ventrally the first visceral arch or mandibular arch also grows in the same direction, and the space between the inferior surface of the fore-brain and the upper surface of the first arch is the beginning of the mouth and nose activities, now called the stomodeum. From the base of the mandibular arch is seen also the rounded bud, which is beginning to grow forward along the base of the fore-brain to form part of the maxillary arch, and finally the upper jaw. At this time also the area which is to develop the sense of smell appears on each side at the outer and lower portion of the fore-brain. The olfactory areas grow out of the base of the fore-brain, at first being on the outside of the head and in the latter development being inclosed, leaving an opening to the surface, the nostril.

It will be understood that by the growing forward of the mandibular arch there is left an almost cubical space between the lower surface of the fore and mid-brain and the upper surface of the mandibular arch. This is a part of the outside world and is inclosed to form the mouth and nose cavities. This process is best understood

if we think of the development from the anterior end of the forebrain of a process which may be described as a curtain dropping down, making a central piece, and the bud from the mandibular arch on each side growing forward to unite with it, leaving a slit between them and the mandibular arch which will be the mouth. In order to get a correct idea of this process it must be followed somewhat more minutely.

As the fronto-nasal process develops it is made up of four rather bulblike portions, two occupying the center which develop into the intermaxillary bone containing the incisor teeth and the center of the lip; and two side or lateral processes which grow out around the olfactory area and form the alae of the nose surrounding nostril. These do not unite again with the central parts, but the end stops over the point where the maxillary bud unites with the central process. A failure of union causes the deformity of harelip, the opening in the lip extending to one or if double to both nostrils.

When the central part of the fronto-nasal process has united with the maxillary bud on each side the arch of the upper jaw is complete and the original cubical space or stomodeum is inclosed, leaving only the slit between the maxillary and mandibulary arches which is to form the mouth, but the inclosed space is in one chamber, there being no separation between the mouth and nose cavities. The time of this development in the human embryo may be placed at about the fourth week.

The separation of the mouth and nose cavities occurs by the development of horizontal ingrowths from the three parts making up the maxilla and beginning at the center and progressing backward. First a small triangular piece from the central part of globular processes of the fronto-nasal process, this uniting with the horizontal or palatal process of the maxillary buds on each side until these reach the apex of the triangle which will be the intermaxillary bone, just a little way back in the palate and from here backward they unite with their fellow of the opposite side. This is best seen by removing the mandibular arch and viewing the parts from below.

The deformity of cleft palate is then a later development than that of harelip and either may occur without the other, though they are usually found together. The cleft of the palate usually turns to one side at the front, running out between the cuspid and lateral unless

it is double, when a detached piece is found in the center in front containing the incisors.

As soon as the nose and mouth cavities are separated, and as fast as bone is formed in the septum, most of the space in the bone is occupied by the tooth germs. At birth almost all of the space between the roof of the mouth and the floor of the nose and the floor of the orbit is occupied by the developing teeth. The development of the face from birth to maturity is characterized by a growth downward from below the eyes, a baby's eyes being at the center of the face, an adult's in the upper third of the face. This growth at first accompanies or is caused by the growth of the permanent dentition, and as the permanent teeth are erupted the spaces that they occupied are converted into the maxillary sinuses.—*Review, Dec., 1901.*

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ASPHYXIAL FACTOR IN NITROUS OXID ANESTHESIA. By T. P. C. Kirkpatrick, M.D., Ireland. Asphyxia may be defined as that condition into which an animal passes when for any reason the due oxygenation of its blood is interfered with. The condition is the result of the want of oxygen rather than due to the accumulation of CO_2 in the blood, for such an accumulation in the presence of a sufficiency of oxygen acts as a narcotic poison not unlike nitrous oxid itself. This, then, is the cardinal point which you must bear in mind: Asphyxial phenomena are the expression of the want of oxygen by the organism and the indication for treatment is clear and definite—supply oxygen, or, what is the same thing, atmospheric air.

When the supply of oxygen is completely cut off from an animal the condition of asphyxia develops and the symptoms which it presents are usually grouped into three stages as follows: First, the stage of exaggerated breathing or hyperpnea. The respirations are increased in frequency and depth, the inspirations being at first particularly prolonged and exaggerated. The respiration is accompanied by a distinctly audible sound, the lips get blue, the eyes prominent, and the blood-pressure begins to rise. This stage lasts for a minute or longer, according to whether the deprivation is gradual or sudden and complete, and gradually passes into the second stage, the chief characteristics of which are dyspnea or difficulty of breathing and convulsions. All the symptoms of the former stage become more marked, and soon the respirations become

convulsive, while the other muscles of the body are thrown into a state of clonic convulsions, or what in gas anesthesia is known as jactitation. This stage is slightly shorter than the preceding one, and the blood-pressure continues to rise considerably, while the cyanosis becomes very marked.

The third stage of exhaustion follows, the spasms give way, the muscles becoming relaxed, and the patient is insensible, with widely dilated pupils. The blood-pressure now falls rapidly below normal, and the pulse is scarcely perceptible, paralysis of the respiratory center takes place, and death ends matters. If the heart be examined at once after death, it is found that the right side with the pulmonary arteries and systemic veins is gorged with dark-colored blood, while the left side of the heart is empty, as are also the pulmonary veins and systemic arteries. Small hemorrhages may be found under the serous membranes.

This, then, is a picture of asphyxia, one which fortunately we seldom see in its entirety, but which in parts is common enough in gas anesthesia, how often you will recognize if you compare it with the anesthesia of nitrous oxid and oxygen, though the only difference between the two is the admission of oxygen in the latter and its exclusion in the former. When oxygen is administered with the gas we get an anesthesia characterized by a quiet, sleepy-like breathing, with a natural color, quiet pulse, relaxed muscles, fixed eyeballs and normal pupils. When you fully grasp the difference between these two conditions and recognize that it is due simply to the admission or deprivation or oxygen, you will be in a better position to appreciate the signs of asphyxia, even in the slightest degree, and so either avoid it altogether or keep it properly under control. When you are able to do this you will be able to avoid what is by far the commonest cause of all the accidents and untoward circumstances which are likely to arise from the administration, not only of nitrous oxid, but also of ether and chloroform. Your anesthesia will in every case be better, and should an accident arise your patient will be in a far better position to meet it than would be the case were the asphyxial factor also added to the danger.

Let me now try and illustrate these principles by a few examples, and point out to you some of the Protean forms in which this asphyxial element appears in actual practice. There is no difficulty in recognizing it when it appears in its native hideousness, as was

the case in the old method of gas-administration. Here oxygen was excluded till the patient had passed well into the second stage of asphyxia; then the operation was begun, and by the time the asphyxia had passed off the patient had regained consciousness. Experiments have shown that after breathing nitrous oxid for a period of 105 seconds the oxygen in the blood is reduced from 21 to 52 vols. per cent. in other words, more than three-quarters of the oxygen in the blood had been used up by the tissues, and since oxygen is essential to the life, not only of the organisms as a whole, but to each cell in that organism, you see how near death a patient may be brought by this method of administration of gas. If, then, after such an administration the respiration ceases from any cause there is but a small margin of time during which it is possible to restore the patient. Fortunately, in the vast majority of cases this margin, though small, is sufficient, and by artificial respiration it is possible to introduce a fresh supply of oxygen. In such cases the signs are so evident and so aggressive that there is no possibility of mistaking them, and no difficulty in recognizing what treatment is necessary. The success of this treatment, however, depends on the fact that usually the action of the heart continues in spite of the cessation of the respiration, for not only must the oxygen get to the blood, but also the oxygenated blood must get to the tissues, and especially to those tissues the integrity of which is essential to life —that is, the great nerve centers of the medulla. One of the conditions of asphyxia, however, we have seen is that the right side of the heart becomes distended with blood while the left side becomes empty. The empty ventricle, however, cannot contract, and in the distended ventricle the force which is necessary to expel the blood increases as the cube of the radius of the cavity, so that the work thrown on the heart is greatly increased. If the heart is healthy it may be able to meet this extra strain, but if it be debilitated or degenerated it may be quite unable to do so, with the result that death takes place.

In the earlier stages of asphyxia we have seen that there is a very considerable rise in blood-pressure. This means more work for the heart and considerable strain on the walls of the arteries. If the arteries are degenerated, as is so commonly the case with old people, they may rupture, and possibly a fatal cerebral hemorrhage results, as has actually been recorded in practice, and hence old age has

been given as a contraindication for gas anesthesia. The only remedy here, it is needless to say, is prevention.

These are extreme conditions and fortunately, not commonly met with in practice; there are, however, others, not so dangerous perhaps, but sufficiently objectionable to justify considerable trouble to avoid them. As such may be mentioned the jactitation so commonly met with in gas anesthesia, and which is so inconvenient to the operator. This is really the clonic convulsions of the second stage of asphyxia, and may easily be abolished by the simple expedient of allowing the patient more air. There is another phenomenon, perhaps more annoying, but which is not so well recognized as due to the want of oxygen. I refer to the struggling often met with in the earlier stages of the administration before the patient is "off." You are all familiar, by reputation at all events, with the struggles of the drowning man—that is, the violent conscious efforts which are stimulated by the feeling of smothering or want of oxygen, the feeling that one must get air at any cost. I am convinced that the cause is the same in the two cases—the want of oxygen. This struggling is not so commonly met with during the administration of nitrous oxid as it is during that of ether, for the simple reason that in the case of the former consciousness is usually abolished before the want is felt, while in the latter it is not. In proof of this I have found that in the case of men who often require a considerable quantity of gas to anesthetize them struggling is likely to take place. Hence the old teaching was that the way to subdue these struggles was to press the anesthetic; whereas the truth is they can be much more quickly, effectually, and pleasantly abolished by the admission of some air. This I have found to be true after some bitter experience in my own practice, and now always endeavor to anticipate their onset either by a rapid anesthetization with gas or by free administration of air with the anesthetic.

In many cases the only evidence of asphyxia which will be present is the great increase in the frequency and depth of the respirations—that is, the hyperpnea of the first stage. It is, however, very important to recognize this, not only as a warning of what will certainly follow if it is neglected, but also because often this overstimulation of the respiratory center is apt to be followed by a period of apnea or absence of respiration, which before it passes off may induce a very profound degree of asphyxia, causing consider-

able trouble and alarm. I have seen patients in this condition become almost black in the face, to the great alarm of the bystanders, before respiration was again reestablished. Under ordinary circumstances the condition is devoid of danger, but in the case of a weak heart or degenerated vessels it might possibly lead to a fatal result; besides, in my experience it is almost always followed by very violent headache after recovery.

Many of you will have found, when beginning extractions under anesthetics, that the swollen state of the tongue considerably impedes your manipulations in the mouth. This condition results from the fact that in the conscious state the muscles of which the tongue is composed are in a state of tonic contraction, while during anesthesia they are more or less relaxed. Now asphyxia, even in slight degrees, leads to the stagnation of the blood in the veins, and thus in the tongue the swelling due to the relaxation of the muscles may be greatly increased, so much so that any operation in the mouth is rendered very difficult. This venous congestion also favors hemorrhage from the sockets of the extracted teeth, which further obstructs the operator. This is a matter of no little importance when the time available for operation can be counted only in seconds.

I have said perhaps enough to convince you of the advisability of avoiding the asphyxial element in anesthesia, and these remarks apply with as much force to the administration of ether as of gas, while in the administration of chloroform any asphyxia is attended with great and special risks. In the case of nitrous oxid anesthesia it is not always possible to avoid it altogether, and often it may be advantageously made use of as a help, but this should be done only knowingly, and in so far as it is possible to keep it properly under control. In many cases it is not easy to get a sufficient depth of anesthesia without it—that is, to administer enough gas to anesthetize the patient while at the same time we give enough air to supply his oxygen needs. This was the reason why the introduction of nitrous oxid and oxygen anesthesia was such an improvement on that of pure nitrous oxid. You will remember that the atmospheric air contains some 79 per cent of nitrogen, which for respiratory purposes is absolutely useless, so that to give 21 vols. of oxygen one must give 100 vols. of air. It is not at all an easy matter to give this large quantity of air and still give enough gas

to maintain anesthesia, so that a slight limitation of the oxygen may not only be useful but necessary. This should be done, however, only with a full knowledge of its effects, and the limitation should never be permitted to go till the dangerous symptoms of asphyxia rise.

As regards treatment, the indications are plain and unmistakable. Supply oxygen either by permitting the patient to freely breathe air, or by compelling him to do so by means of artificial respiration if the natural function is in abeyance. In order to accomplish this it is necessary to see that the air-way is free and unobstructed, either by the tongue falling back, or by blood or other foreign body in the air-passages. As long as the circulation is maintained and the air-way clear, one or two respirations are sufficient to lessen the cyanosis and indicate the onset of recovery. If this does not at once take place, you may conclude that either the air is not entering the lungs or that the heart is not driving the oxygenated blood into the peripheral arteries. Thus, if the pulse continues to beat, you are justified in the conclusion that the air is not passing into the lungs, and that either there is some obstruction in the air-passages, or your method of artificial respiration is inefficient. In the former tracheotomy should be performed at once unless the obstruction can be removed, as any delay is attended with the greatest risk. If it is the circulation that is at fault, tracheotomy is worse than useless, being absolutely harmful and adding a further and unnecessary shock to the patient. The condition will in this case be the result of one or two causes—either syncope from the want of a sufficient supply of blood in the heart and great vessels, or obstruction of the heart from overdistension. It is of great importance to diagnose which of these conditions is present, as the treatment of each is diametrically opposed. This diagnosis in many cases is by no means easy, but with due care and attention can generally be made. If the condition has arisen early in the administration after struggling, and is attended with marked congestion of the face and deep cyanosis, the probability is that the case is one of overdistension; while if it occurs later after the administration has continued for some time, and then comes on suddenly without warning, being attended with pallor rather than cyanosis, it is most likely due to syncope. In the latter case complete inversion of the patient is the best remedy, while if there is overdistension of the heart this pro-

cedure will only aggravate the condition. In cases of overdistension one should endeavor to empty the heart by intermittent pressure over the precordial area, and possibly open one of the jugular veins, artificial respiration being kept up continuously in each case. Drugs here are probably quite useless, for if the circulation has stopped it is impossible to convey them to the organ on which it is wished that they should act. Electrical stimulation is also useless, for if it reaches the heart at all, which is doubtful, it would probably inhibit its action. From this you will see that the curative agents at our disposal are not very numerous, nor are they very efficacious; hence there is all the more reason for avoiding the necessity of using them by proper preventive treatment.—*Dental Record.*

* * *

PASSING AWAY. Take a walk through any of the cemeteries throughout the country and you will believe with us that fools are slowly but surely passing away.

With silent tread you pass the last resting-place of the individual who blew into an empty gun.

The modest tombstone of the hired girl who lighted the fire with kerosene, and the grass-carpeted mound that covers the mortal remains of the boy who took a mule by the tail.

The tall monument of the man who didn't know it was loaded overshadows the dug-out of the man who jumped off the cars to save a ten-rod walk.

Side by side lie the remains of the ethereal creature who always kept her corset laced up to the last hole and the intellectual idiot who rode a bicycle nine miles in ten minutes.

Here reposes the young doctor who took a dose of his own medicine, and the old fool who married a young wife.

Right over yonder in the northwest corner, where the gentle breezes sigh through the weeping willow that bends over his lowly bed, lies the fellow that told his mother-in-law she lied.

Down there in the potter's field, with his feet sticking to rude blasts of winter and blistering rays of summer's sun, is stretched all the earthly remains of the misguided regulator who tried to lick the editor, while the broken bones of the man who wouldn't pay for his paper are piled up in a corner of the fence.

Near by, his grave unmarked, reposes the moldering dust of the printer who starved to death trying to run a first-class paper in a fourth-class town.

Over by the entrance reposes the boy who went swimming too early in the season, and the old lady who kept strychnin and baking-powder side by side in the cupboard.

Right there in the path directly in front of the entrance, obstructing the way, is the grave of the microbe-killer who rinsed himself inside and out with antiseptic solutions until his agonies were cut short by acute softening of the brain.

The fool-killer gathers them in, one by one, and by and by we will have a pretty decent world to live in.—*Ex.*

* * *

ACIDS OCCURRING IN THE MOUTH. By H. H. Boom, M.D., Philadelphia. When the mixed saliva, normally alkaline, possesses an acid reaction, the acidifying substances must result, either from processes of fermentation of substances retained in the mouth, or from a true glandular secretion entering the mouth. Fermentation of food particles in the mouth is brought about through the exciting presence of certain bacterial organisms. The variety of fermentation induced, and the products resulting, will be determined by the character of the food particles and the nature of the bacterial forms present.

Dr. Willoughby Miller, in his work, "The Microorganisms of the Human Mouth," states that of twenty-five varieties of bacteria occurring in the mouth, sixteen were found capable of occasioning fermentation of carbohydrates, with the production of acid results.

Lactic Acid.—Of the acids resulting from fermentation of carbohydrates in the mouth, this is the one occurring in the largest quantity and possessing the greatest interest to the dentist. Lactic acid, $C_3H_6O_3$ is best known as the acid of sour milk. The pure acid is a colorless, syrupy, strongly acid liquid. It is without odor, and has a marked affinity for moisture, which it readily absorbs from the air. It mixes readily with ether, alcohol and water. There exist several varieties of lactic acid. One of these varieties, known as paralactic or sarcolactic acid, obtained from meat, turns the plane of polarized light towards the right. Another variety, resulting from a peculiar fermentation of sugar, is identical in every respect with paralactic save that it occasions left polarization. Lactic acid results from the fermentation of many vegetable substances, and also from meats. It is interesting to the dental operator, as it is produced in larger quantity from fermentation of food particles in

the mouth than is any other acidulous substance. Its relative proportion in saliva has never been found to exceed .75 of 1 per cent. The production of lactic acid through fermentation occurring in the mouth is generally accompanied by the formation in much smaller quantities of certain other acids, among which formic, acetic and butyric acids are best known.

Quoting from Dr. Miller's work: "A particle of starch introduced into the oral cavity would undergo about the following successive changes: In the first place, it is, in part at least, transformed into grape sugar by the action of ptyalin of the saliva. This grape sugar in turn is split into lactic acid through the action of various bacteria in the mouth. The lactic acid unites with the lime of the teeth or tartar, forming lactate of lime." The latter may then undergo various fermentations, giving rise to new acid products and to the formations of the corresponding lime salts, from which, by still other processes of fermentation, acids are again produced.

Diathesis.—When the acidity of saliva does not arise from local fermentative action, we may by the use of litmus detect a positively acid secretion issuing from the labial and buccal glands and pouring directly into the oral cavity. Such instances afford a symptom of a general constitutional condition, which condition present is generally an inherited one, and is known as "diathesis." The medical profession recognize a number of these so-called diatheses of personal predispositions to certain special diseases. Thus we study the tuberculous, the gouty, the rheumatic, the scrofulous diathesis, etc. In many of these diatheses we find an increased acidity of all the fluids of the body. This is particularly true of the rheumatic and the gouty diathesis. It has been well established by careful observation that in both the rheumatic and the gouty diathesis the underlying pathological condition is the diminution in the number of the red blood corpuscles, and an apparent increase in the number of white blood corpuscles. Now, if the number of red blood corpuscles be decreased, we would have a lessened quantity of oxygen carried from the lungs to all structures of the body.

Theory of Acidity of Saliva.—Through this deficiency of oxygen the waste products, especially the albuminoids, fail to be completely converted into the normal excretory substance urea; but in its stead uric acid is formed and passes into the blood. When uric acid enters the alkaline blood it probably unites with sodium to form

the neutral sodium urate, $Na_2C_5H_2N_4O_3$. From a general deficiency of oxygen all cellular structures suffer, so that waste products of the cells throughout the body are but imperfectly removed, and carbon dioxidate accumulates in the cell instead of being carried away to the lungs by the red blood discs. If we dissolve neutral sodium urate in water in a test tube, and pass a current of CO^2 gas through the solution, the neutral sodium urate at once changes to acid sodium urate, the reaction being $Na2C_5H_2N_4O_3$ plus $2CO_2$ plus H_2O equals $NaH\ C_5H_2N_4O_3$ plus $Na\ HCO_3$ plus CO_2.

Now we have the same conditions present in the living cells throughout the body as are present in the experiment. The cell contains CO_2 not removed through a deficient carrying capacity of the fewer red blood corpuscles. The cell contains neutral sodium urate as a deposition from the blood. Moisture is present, so that all conditions are favorable to the formation of acid sodium urate, and we can safely assume that this substance is so produced.

We now find present in the cell acid sodium urate, acid sodium carbonate, an excess of carbon dioxid and moisture. Separated from the cell by the thin capillary wall circulates the blood, containing neutral sodium phosphate. This being readily diffusible, passes from the blood through the capillary wall into the cell, and coming in contact with acid sodium urate it at once undergoes conversion into acid sodium phosphate, and as such, in the case of the labial glands, is at once poured into the oral cavity. The reaction here taking place would be represented by the equation: $NaHC_5H_2N_4O_3$ plus Na_2HPO_4 equals $Na_2C_5H_2N_4O_3$ plus NaH_2PO_4.

The newly formed acid sodium phosphate, readily soluble, at once passes from the labial glands into the oral cavity. The difficultly soluble neutral sodium urate is retained in the cell structure to be there acted upon by carbon dioxid and moisture, and to again revert to the form of acid sodium urate to again act upon an additional quantity of sodium phosphate from the blood. Upon this chemical act the acidity of the saliva largely depends.

We make the broad statement then, that in pathological constitutional conditions, although we may find uric acid, acetic acid and other organic acids present in saliva, the acidity of such saliva is largely due to the presence in it of acid phosphate of sodium. This is offered as a theory, the truth of which chemistry seems to sustain. —*Items, Jan., 1902.*

Letters.

DR. BLACK REPLIES TO QUESTION ABOUT "PULP AND DEVELOPMENT OF THE TOOTH."

CHICAGO, Jan. 29, 1902.

To the Editor of the Digest,

MR. EDITOR:—Regarding the question on page 69 of the January DIGEST I would say, that if the pulp of the tooth is destroyed the apex of the root will not be completed, nor will the apical foramen be reduced to what would be the normal size in the adult tooth. On the other hand, if alveolar abscess can be prevented (a doubtful case) the eruption of the tooth will probably be completed and it will resume its proper position in the arch.

In answer to the question as to the best method of procedure in the case presented, I would say: First make an accurately fitting gold cap that will cover the incisal half of the crown and cut out the mesio-incisal angle sufficiently that treatment and filling can be made through the opening. Then cement this to place, protecting the pulp against pressure. Through the opening in shell make such treatment as may be necessary, cap the pulp and fill temporarily. The gold cap will securely hold the pulp-capping and the temporary filling. If the pulp is retained alive and healthy the apical portion of root will be completed by the time the lad is ten or twelve years old, the pulp-chamber and canal will be reduced to normal size for that age and the exposure recovered with normal dentin. Then or later the case can have a permanent filling.

Yours truly, G. V. BLACK.

DR. NOYES REPLIES TO QUESTION ABOUT "PULP AND DEVELOPMENT OF THE TOOTH."

CHICAGO, Feb. 3, 1902.

To the Editor of the Digest,

MR. EDITOR:—In reply to your correspondent, page 69, in January DIGEST, I would say: The chief if not the only function of the dental pulp is the formation of dentin, and no other organ or tissue appears able to perform its office vicariously. It therefore follows that after loss of the pulp no more dentin will be formed. The development of the cementum and peridental membrane follows or

accompanies but does not precede that of the dentin. In order therefore that the development of a tooth may proceed after the loss of its pulp, there must have been previously formed at least an external layer of dentin throughout the whole length of the root to its apex. If development of dentin has proceeded to that extent, and the disturbances caused by loss of the pulp have been followed by a return to health of all the other tissues, then further development of the cementum and peridental membrane may proceed.

In the case cited, every possible effort should be made to save the pulp alive, by preserving it from infection if possible, or if that has already taken place or is suspected (and it must be suspected unless protection was applied almost immediately after the fracture), by counteracting the infection by non-escharotic antiseptics, and the efficient protection from subsequent danger of infection and from every source of irritation.

Before the development of the root is complete the pulp-vessels enter by a channel as wide as the pulp itself, and there is no danger that it will be strangulated by hyperemia. It is also at the summit of its functional activity and will live through much harder usage then than at a later time when the most important part of its life work has been completed. There is great encouragement to make every effort and take all chances that are unavoidable for the preservation of such pulps. A pulp should never be destroyed in a tooth the root of which is not fully developed. If it dies we must then do the best that circumstances permit, but we should never have to answer for killing it. In the case cited the root must be so incomplete as to make the loss of the tooth certain if the pulp is lost or destroyed soon after the accident.

Yours truly, EDMUND NOYES.

THE BOSS TRIES ADVERTISING.

(AS TOLD BY THE OFFICE BOY.)

We was havin' a Dull Spell in the Offis one week in House-Cleanin' time, an' the Boss says he, "James, when business gits dull like it is now, blamed ef I ain't a mind to try advertisin' fer a change. The code of Ethics says you mustn't but dern the code of Ethics. The nearest I kin make out of it is that the code is intended to keep back the young fellers till all the old ones is dead an' beyond needin' any business. So I say, dern the code of Ethics;

Give us all an equal Show. It ain't no wuss Advertisin' than it is settin' about to build up Practice by underhand methods o' runnin' other dentists down. I ain't never tried advertisin,' but it seems to me a nice, neat, modest advertisement wouldn't be so Bad. Blamed if I don't try it sometime, James."

Jist then the bell rung, an' it was Funny, but who should it be but a man that said he wanted me to call the Boss out, no matter what he was a-doin', fer he represented the Blue Book, an' he was under strict orders not to pass Dock Contour by, no matter ef he didn't git no other dentist in town. So I told the Boss it was somethin' he wouldn't want to miss, an' he throwed away his Cigar an' went in the Hall, where the man was. Says the Man, "Doctor Contour, I believe? I've knowed you fer years, by sight, an, once you pulled a baby tooth for my little Girl. It had growed Crooked, or something, an' Dock Peabody acrost the Street, he said it orter be let be, but the Minute you seen it, you said it orter to come Out. Me an' you was Agreed on that, an' my Wife she pulled agin it, sidin' with Dock Peabody, an' I reckon it was about a half Hour before me an' you could make her Give In. An' then after it was Out, she wouldn't consent to your"—

The Boss he interrupted him jis' then. Says he, "Yes, I remember all about it. It happened on the umphteenth day o' December, seventeen year ago, about six o'clock P. M.. Oh yes, I recall that distinctly. In fact I ain't thought about nothin' but that pertick'ler tooth, ever since. An' after it was out you told me about how yourself had a Dentist that didn't understand his business try to pull a Tooth fer you, an' he give three Jerks an' had to stop an' Rest, an' you set there never movin' a Muscle, lettin' him do jis' whatever he Pleased. An' after he got it out the Roots brung away a big piece o' the Jaw Bone that had growed 'round. An' the Dentist said he never in all his Born Days seen sech a case. You was abont a Hour tellin' me the Pertick'lers, an' you never charged me a Cent fer what yon'd Learned me about Dentistry. I remember the hull business, distinc'ly."

The Boss he wore a Pleasant Smile, while he was Talkin,' yet somehow I got the Idee in my Head that he'd like to kick the gentleman through the Transom. Then he went on: "After you'd wore me out you said, what was the charge for pullin' Baby Teeth, like it hadn't orter be Mutch, an' I said fifty cents. You said you'd drop in the Nex' Day an' pay, but you never Dropped."

I seen right away, from the Guilty Look on the man's face, that what the Boss was a-sayin' was likely enough True, only it didn't happen so Long Back. The Boss has a Way of Exaggeratin', when he wants to be reel Funny, an' he didn't mean it was Seventeen Year back, Reely. So the man bein' three or four sizes smaller than the Boss, he began to Cry, an' says he, "That wasn't me, Dock after all. I forgot; I've got a Twin Brother that looks as mutch like me as Two Peas, an' you hadn't orter put things on me that he Reely Done." So the Boss he apologized, after the Man had explained a lot more, an' he let on like he was convinced it Reely wasn't him at all, yet I could see he wasn't Fooled wuth a Cent.

So d'rec'ly the man he Wiped his Eyes, an' said he, "After all I'm glad all that you've been a-tellin' me, happened, fer it does seem like a Special Providence has put it in my way to make Amends fer my Wicked Brother's wrong doin'." He stopped a Minute to Sop his Eyes, an' then went on: "*The Daily Globe,* the leadin' Journal of this City, sent me here to interview you relatin' to Dentistry. The *Globe* has got a Idee that it orter lend a Hand in the business o' Elevatin' the Dental Perfession, from Heerin' the subject discussed in your Dental Conventions. It wasn't only this Morning that the Honorable Silas Manson, late member of Congress, an' now Editor of the *Globe,* says he to me, 'Anderson, (he always talks familiar to me, 'cause he's knowed me an' all my Folks so long), says he, 'Anderson, they's one thing been on my Mind for Months an' I ain't never reely got Time to attend to it. An' even now I ain't got the time, an' so I must ast you to discharge the Duty fer me. Says he, they's a poor, strugglin', deservin' class o' Perfessional Men in this city that's long been conspicuous in the Public Eye, fer the onselfish manner in which they've served the community. I'd like to see them rewarded by helpin' them take a higher place on a True Plane of Perfessional Fellowship with the older Perfessions. I understand they's a Organization just been organized, to publish a Blue Book, a kind of Exclusive society directory, containin' only the Elite of the City. Now I've conceived the Notion that they ain't no Class o' Perfessional men better entitled to a place in that Blue Book than the Dentists. But I find that the reel Obstacle to their gettin' in, is that they ain't quite well enough Known. That's too Bad, but it ain't beyond Remedying. Let's *make* 'em known. I'm willing to do my share in this Noble Work;

I'll give a page o' *The Daily Globe*, gratis, for one day, to be took up exclusively by descriptive sketches, biographies, an' so on, of the leadin' dentists of this City. The *Leadin'* dentists, you understand, Anderson. Don't you let me ketch you bringin' into this Offis any names o' snide dentists. Mind you; you're a Old Friend o' mine, an' I wouldn't want to do you no Harm' but if you fetch me any names of any but the Very Exclusive an' Leadin' dentists of the City, I'll throw you out of the window. An' whatever is wrote up about them has to pass my personal censorship. I won't allow any but the ablest of my Editors to do the writin', and you're to see that nothin' but facts given by the dentists themselves is submitted. Now go, an' be Offul Careful what you're about. So as I was leavin' he called me back. Says he, 'I'd recommend that you go first of all to a few of the reely representative men, the cream o' the Perfession, such as Dock Contour, an' Dock Puffy, and Dock Hotty. That feller Peabody, right acrost from Dock Contour ain't no Good. You see that you leave him out'."

The Boss he was Smilin' all over by this time, but it seemed like he wasn't willin' to Jump without takin' a Squint er two. Says he, "In the first place, I don't approve o' advertisin'. I ain't never done it, an' it might excite comment if I was to begin now." Then the man he looked kind o' Injured, an' says he, "Who mentioned Advertisin'? This ain't advertisin'; it's jist a rare chance to put yourself on Record as a dentist totally opposed to the Class o' Humbug Dentists what *doos* advertise. I'm afraid you don't quite appreciate the Favor our Mr. Manson is offerin' to do you personally, an' the body of the Perfession represented by yourself."

So that seemed to make it all right with the Boss, only he ast one more question; says he, "What's all this here likely to Cost me? I ain't one o' the kind to buy a pig in a poke." Says the gentleman, "Of course our editor, Mr. Manson, he wouldn't want to charge a cent, seein' as he's disinterested in the Matter, an' only aimin' to Raise the Dental Perfession up where it had Orter Been long ago. However, the las' thing he said to me was this: says he, 'Anderson, human nature is a Curi's Thing, an' it'll Pay you to Study it every time you git a Chance. Now here, for instance, you've got a Fine Chance. If you was to go to them Dentists an offer them a place in our Blue Book an' in our Paper, fer nothin', they'd imagine right away, it wasn't no Good. But if you say to them, it's goin' to cost

you Ten Dolers, they'll think it's something worth while. An' I'd recommend you to ask fer the Ten Dolers in advance, fer this reason:—the other dentists you go to after seein' such men as Dock Contour an' Dock Puffy, noticin' that they've subscribed an' Paid Up, will see right away what a Rare Chance it is, an' you won't have to spend no Time explainin' all the Details, like you may need to do when you see Dock Contour. It's a Suggestion at Least. It's somethin' us Congressmen Learned when we was in Washington; always aim to save Time.'"

The Boss he seen what a Fine Thing it was, an' so he told the man how he come to go into Dentistry, an' how long he'd been practicin', an'a lot o' stuff fer him to Take Down. The gentleman he promised to use lots o' Discretion an' Delicacy in writin' up from these notes the Article he intended to Publish, an' he reminded the Boss how every word had to be inspected by Mr. Manson himself, an' he'd be mighty pertick'ler, seein' it was finally all to go in the Blue Book, an' he said it would appear in the nex' mornin' Paper, an' in the Blue Book about a Week later. The Boss he writ a Note then, an' he told me to take it over to Dock Peabody, and I Done It, an' Dock Peabody, said he, "Dern this everlastin' borryin' from me an' never Payin' Back for Three Months!" an' he looked Offul Sour, an' thinks I, blamed ef I ain't more'n Haf in Sympathy with them sentiments, but I didn't say nothin' an' after a long Spell o' thinkin' how he could Git out o' it, I reckon, he Peeled Off a ten doler Bill from a wad, an' I took it back to the Boss. He give it to the Man, an' says he, "I hope that'll bring me some business, fer I need it," an' the man, says he, "'ef this here don't bring you a Thousan' Dolers before a Month, I'm a Phillippino Squaw." Then he went away.

Well, the nex' mornin' sure enough, here was the Article, coverin' a Page of the *Daily Globe*. I took the paper in the Laboratory, where the Boss was soakin' a Corn an' cussin' under his Breth. He was Offul interested, an' he couldn't wait till he'd got done an' dried his Hands, so says he, "you jis' read it, James; go kind o' slow, so as we kin Drink it in, an' you won't make no mistakes." So I begun with readin' the headin.' "It's got the Title at the head of the page," said I. "It's in great big letters, readin,' 'Denistry.'" "What's that, James? Read that agin," said he. So I read it, 'Denistry.' An' says he, "Nonsense, James, you read that right,

now. What's the matter of you! Dentistry is the word, D-e-n-t-i-s-t-r-y is the way it's spelled." Said I' "That's all right, but this is spelled 'D-E-N-I-S-T-R-Y,' You can see as good as me." The Boss snatched the Paper out o' my Hand, reel Impatient. "What's the matter of you, James; you'd orter go back to school an' learn to read. This is Disgraceful!" says he.

He put on his Glasses an' then he tackled it. "Dern my Buttons, James, ef it *ain't* Denistry! An' here the first Thing is the Article about me Say, James, somethin' tells me in Advance, I ain't a-goin' to like this! Listen, it says: 'Dock Contour is perhaps the oldest practitioner among the Dentists in this City.' Oh Thunder, James, an' me only thirty-seven years old!" The Boss groaned Offul. It reminded me of my uncle's Hoss on the Farm, when he got in the Oat-Bin one night, an' he was so Swelled Up in the mornin' they couldn't git him through the Stable Door, an' he lay there a-Groanin' an' nearly Bust. "People readin' that, James, 'll say right away, 'I knowed it; he can't see no more; that's why my Fillin' come out!' Let's see what else it says, James. Listen here—'Dock Contour is the Peer of any Denist of this City,—(*Denist*, James!) an' when it comes to the question of Price, he don't allow no Dentists to come near him. Best quality, low Prices, is his Motto."

The Boss quivered like he was a-goin' to Faint. "Oh James, this is Offul! I feel Sick, James. Go in the closet there an' bring me out that Bottle o' Tonic, on the shelf. It's red-lookin' Stuff, James."

So I brung the Bottle, an' the Boss he filled a Glass with it, an' says he, lookin' solemn, "This is Poke-Berry juice, James. It's a fine Tonic for Men. But it's Offul Pizen for boys. You know all about that, I reckon. Don't you ever ferget an' Taste this, James." Then he Drunk it. It seemed to help him, for he took up the Paper agin, presently.

"I ain't a-goin' to look at this about me, any more, James. But how's this here? I don't see nothin' about Puffy, nor Hotty, nor even Dock Measley. Say, James; this here is gittin' Wuss and Wuss! Oh Horrors, James! here's the Atchison *Painless Dental Parlor* an' the *Washington Dentists' Boudoir*, an' the—James, will you listen to this." (He was lookin' at the Article about himself, agin.) "It says, 'menny is the Old Man an' Woman a-goin'

about the streets of our City with a Set o' Doctor Contour's Cheap Teeth in their Mouth!' Say James; You git my Lead Mallet out o' my instrument case, an' you tap me one on the Gong, fer bein' the Blamdest Fool Dentist in the Perfession! O, a-hoo!"

I thought at first he was a-goin' to Vomic, but he didn't, only he slid down in his Cheer an' shet his Eyes like he wanted to Forget everything. So I got the Mallet, an' I come up behind him, an' I hit him one not so Offul hard, about hard enough to drive a Tack, right on his Bald Spot. An' he give a Yell, an' to my Surprise he slid down clean on the Floor, groanin' an' rubbin' his head like he was Hurt. I seen he was too, an' bein' Scairt I run to his case an' got a bottle o' Creosote, an' then I remembered him a-sayin' about it not agreein' with some folks, on account o' their idiosyncrasy, or somethin', so I didn't only pour on about a Teaspoonful. It seemed to act the Funniest on him; the big purple spot turned kind o' Gray, the creosote mixin' with the blood, makin' it look like a chip-beef stew. In a minute the Boss riz up, still groanin' an' says he, "You blamed little Fool you; ain't you got a bit o' Sence!" An' I backed away, for I thought sure he was a-goin' to Hit me, an' after I was behind the sofa, says I, "You told me to do it, an' now you find fault with me 'cause I done it. An' it wasn't only yesterday you told me, says you, 'James, when I tell you to do a thing don't you ast no questions, you jis' go on an' do it, leavin' the consequences to me.' "

An' then he seen he couldn't say nothin' more, so he went out to git some brown paper an' Vinegar to put on his Head. The las' thing says he, "Telephone to the *Daily Globe* offis, James, right away, an' tell them not to put that what's in to-day's paper in the Blue Book. Tell them to leave me out entirely. If they raise any Objection you tell 'em I'll sue them for Damages if they don't do like I say." So I telephoned, an' they said they didn't Know nothin' about no Blue Book, an' I told them about how all that was in the paper that mornin' was to go in the Blue Book, an' the Editor said I be Dam, nobody there in the Offis didn't know what I was a-talkin' about. So then I ast for Mr. Manson himself, an' they said they didn't know where he was, any more, probably in Californy, 'cause he hadn't had nothin' to do with the *Globe* this two year or more. So I told the Boss an' he groaned harder than ever, an' he never said a word, but he went to Bed, right away, an' it wasn't only eight o'clock in the Mornin'.

Cincinnati, O. FRANK W. SAGE.

The Dental Digest.

PUBLISHED THE FIFTEENTH DAY OF EVERY MONTH
At 2231 Prairie Avenue, Chicago,
Where All Communications Should be Addressed.

Editorial.

DECISION OF JUDGE TOWNSEND IN THE KYLE CASE.

Last month we stated that just as the DIGEST was going to press a telegram was received from the Protective Association's local attorney in New York City, to the effect that Judge Townsend had set aside his former decision in the Kyle case on the ground of collusion. We give the decision in full herewith:

INTERNATIONAL TOOTH CROWN CO., *vs.* JAMES ORR KYLE. } UNITED STATES CIRCUIT COURT, SOUTHERN DISTRICT OF NEW YORK.

TOWNSEND, J.

This cause having been heard upon the petition of Allen G. Bennett, et al. to vacate and annul the decree heretofore entered herein, and upon affidavits and arguments of counsel in behalf of the said petitioners and the said complainant, International Tooth Crown Company, and it appearing to the Court that the proceedings therein were procured by collusion between the complainant, International Tooth Crown Company, and the defendant, James Orr Kyle, and that there was no real controversy between them, it is hereby *ordered, adjudged and decreed* that the said decree, to wit, the decree entered on or about the first day of January, 1900, be and the same is hereby vacated and annulled, and that this cause be dismissed.

It is further ordered that said International Tooth Crown Company pay the disbursements incurred in the said application for vacation of said decree.

WM. K. TOWNSEND, *Judge.*

As stated last month, the members of the Association may well congratulate themselves on this decision, for the fight can now be carried on with no unjust odds against us. Again, it will be remembered that in October last a decision was given against a member of the Protective Association on the Low bridge patent by a jury in Judge Lacombe's court. The Association has carried the matter up to the Court of Appeals, and Judge Lacombe has ruled that he will hear no more cases until that court has passed upon this one. He has further ruled that no dentist need show his books in court. Matters are therefore at a standstill in that Federal district, and will

be until the Court of Appeals renders its decision. We have every reason to believe that said decision will be favorable to the Association. As new developments arise we will keep our readers posted.

CONCERNING CHANGE OF DATE OF NATIONAL MEETING.

An effort is being made to change the date of meeting of the National Dental Association, so that those who wish to attend the meeting of the International Dental Federation at Stockholm, Sweden, in August, can do so without missing the National. An investigation of the subject, however, shows that the officers and members of the National, almost without exception, are decidedly opposed to such change, and that only a very few of those who ordinarily attend the National meeting wish or expect to go to Europe. Furthermore, a contract has been signed and the money paid, so that a fine convention hall and series of committee rooms may be had for the National, and the Association is bound by this contract. In view of all these facts it is extremely unlikely that there will be any change.

A canvass is now being made of the members of the Faculties' Association, to ascertain how many desire to attend the Stockholm meeting, and if it is found that any considerable number expect to take the trip an effort will be made to change the date of the Faculties' Association meeting, which is scheduled to meet just previous to the National. We have always maintained, and results have shown, that by having the National Dental Association, the National Association of Dental Faculties, and the National Association of Dental Examiners, meet at the same time and place, all three organizations are benefitted and strengthened. We therefore believe it would be detrimental to all three if the Faculties' Association should now meet at a different time and place from the other two bodies, and the members of the N. A. D. F. will probably hold the same belief.

Notices.

NORTHERN INDIANA AND SOUTHWESTERN MICHIGAN SOCIETIES.

At the meeting of the Northern Indiana and Southwestern Michigan Dental Societies, held at Goshen, Ind., September, 1901, the following officers

were elected for the ensuing year—Northern Indiana Society: Pres., F. G Conklin; V.-P., F. M. Burkett; Sec'y and Treas., M. A. Payne. Southwestern Michigan Society: Pres., C. R. Rowley; V.-P., R. M. Speer; Sec'y and Treas , C. W. Johnson. The next meeting will be held at South Bend, Ind., September, 1902.

TEXAS STATE DENTAL ASSOCIATION.

The annual meeting of the Texas State Dental Association will be held at Waco, May 13-15, 1902. The executive committee promises a fine program and the meeting is expected to be the largest in the history of the Association.

BUSH JONES, Sec'y and Treas , Dallas.

SOUTHERN DENTAL SOCIETY OF NEW JERSEY.

At the third annual meeting and banquet of this society, held at Camden, Jan. 15, 1902, the following officers were elected for the ensuing year: Pres., C. P. Tuttle; V.-P., J. G. Halsey; Rec. Sec'y, J. F. Smith; Cor. Sec'y, T. V. Smith; Treas., M. A. Morrison; Ex. Com., A. Irwin, J. E. Duffield, A. B. DeWees, W. A. Jaquette, W. W. Crate, O. E. Peck.

SEVENTH DISTRICT DENTAL SOCIETY OF NEW YORK STATE.

The thirty-fourth annual meeting of the Seventh District Dental Society of the State of New York, will be held at the Osborne House, Rochester, April 8-9, 1902. A number of valuable papers will be read and a great many clinics given. All members of the profession are cordially invited to attend.

F. MESSERSCHMITT, Chairman, 138 Main St., Rochester.

MISSOURI STATE DENTAL ASSOCIATION.

The thirty-eighth annual meeting of the Missouri State Dental Association will be held at Jefferson City, May 21-23, 1902. Business meetings will be held in the legislative hall of the statehouse and the clinics will be held in the state penitentiary, thus insuring an abundance of clinical material. The papers to be read before the Association are of a most interesting character, and the meeting bids fair to be one of the best ever held in the state. It is certainly to be hoped that with the change in time of holding the meeting, and many other attractive features, the attendance will be all that can be desired.

J. H. KENNERLY, Sec'y, St. Louis.

NEW JERSEY STATE DENTAL SOCIETY.

The committee on exhibits desires to announce that at the thirty-second annual meeting of the Society, to be held as usual in the Auditorium, Asbury Park, July 16-18, 1902, the large room which is especially adapted for exhibition purposes will be devoted exclusively to the exhibits, and every advantage and convenience is here offered for a great display. A special inducement to all exhibitors is the fact that at last year's meeting over five hundred dentists registered at the entrance to exhibit hall. This will be a

"big year" from the exhibit standpoint, as many exhibitors have already written to secure the space generally selected by them. The names of those who do so before the program goes to press will be mentioned therein, together with the nature of their display. It is earnestly requested that those desiring space communicate with chairman at an early date.

F. L. HINDLE, Chairman, New Brunswick, N. J.

ILLINOIS STATE DENTAL SOCIETY—COMMITTEE ON ART AND INVENTION.

The committee on Art and Invention of the Illinois State Dental Society hereby invites and solicits a contribution of anything new in the way of appliances and inventions designed during the past year, which will be of interest to the profession in general. Everything submitted should be sent direct to the undersigned, with detailed description of its use and application, by April 1, in order that it may receive proper classification and consideration in the presentation of the annual report at the coming meeting at Springfield, May 13-16. The committee will care for and return each article submitted, but reserve the right to reject any which in their opinion may not be of practical value.

HART J. GOSLEE, Chairman, 580 Madison St., Chicago.

MASSACHUSETTS DENTAL EXAMINING BOARD.

The meeting of the Massachusetts Board of Registration in Dentistry for the examination of candidates will be held in Boston, March 5-7, 1902. Candidates who have applied for examination will report to the secretary, Wednesday, March 5, at 9:30 a. m., at Tufts College Dental Infirmary, corner Huntington and Rogers avenues, and come prepared with rubber-dam, gold and instruments, to demonstrate their skill in operative dentistry. Any one who wishes may bring his patient. So far as possible patients will be furnished. The Board in every instance selects the cavity to be filled. Partially prepared cavities never accepted. The theoretic examination—written—will include operative dentistry, prosthetic dentistry, crown and bridge word, orthodontia, anatomy, histology, surgery, pathology, materia medica, therapeutics, physiology, bacteriology, anesthesia, chemistry and metallurgy, and will be held at Civil Service Rooms, State House, from Thursday, March 6, at 9:30 a. m., until Friday p. m., March 7.

All applications, together with the fee of twenty dollars, must be filed with the Secretary of the Board on or before Feb. 26, as no application for this meeting will be received after that date. Every candidate for examination must be twenty-one years of age. Application blanks may be obtained from the Secretary. Candidates who have taken an examination and failed, and desire to come before the Board again at this meeting, are not required to fill out a second application blank, but must notify the Secretary as above in order to be examined. The fee for third and subsequent examinations is $5.

G. E. MITCHELL, D.D.S., Sec'y, Haverhill.

News Summary.

"UNEASY rests the aching tooth that wears a crown."

EARL CARTER, a young dentist at Yates City, Ill., died Jan. 25, 1902.

W. S. MARTIN, a dentist at Loveland, O., died suddenly Jan. 17, 1902.

T. E. EDDY, 56 years old, a dentist at Cassville, Wis., died Jan. 26, 1902.

G. W. BAKER, 42 years old, a dentist at Harrisburg, Pa., died Jan. 26, 1902.

J. P. CRUTCHER, 77 years old, a dentist at Nashville, Tenn., died Feb. 7, 1902.

THE name of the *Ohio Dental Journal* has been changed to the *Dental Summary*.

FRANK FREYMAN, a dentist of Dyersville, Ia., died Jan. 12, 1902, from bronchitis.

RACY.—When a man starts for a dentist's office he usually strikes a tooth-hurty gait.

G. L. ROBB, 60 years old, a dentist at Huntingdon, Pa., died from paralysis Feb. 6, 1902.

A. DOUD, 60 years old, a dentist at Ft. Scott, Kan., died Feb. 7, 1902, of Bright's disease.

S. H. WHITMAN, a retired dentist of Newport, Pa., died suddenly of heart disease Feb. 1, 1902.

A. E. SHEETS, one of the oldest dentists in Newark, N. J., died from apoplexy, Jan. 29, 1902.

CARLOS E. WAITE, 61 years old, a dentist at Springville, N. Y., died of apoplexy, Jan. 21, 1902.

O. E. MICKEL, 40 years old, a dentist of Haverhill, Mass., died Jan. 13, 1902, of heart failure.

EXCLUSIVE.—"How exclusive that Brown girl is." "Yes, I don't believe her teeth move in the same set."

A. B. CLARK, for many years a dentist of Chicago, has left this city for Honolulu, where he has opened an office.

O. E. RORK, 52 years old, a dentist at Washington, Ia., died Jan. 18, 1902, from a complication of stomach and other troubles.

INDISPENSABLE.—"Please continue my subscription to the DIGEST. I cannot get along without it." E. J. Tucker, Roxboro, N. C.

J. B. LOUD, 45 years old, a dentist at Cincinnati, O., is dying in that city from consumption, and has to be fed through a rubber tube.

STRENUOUS LIFE.—Peaceful business methods oft succeed where others fail, yet dentists and chiropodists keep fighting tooth and nail.

A. WILKES SMITH, founder of the Louisville College of Dentistry, is critically ill at his home in Richmond, Ky., from neuralgia of the heart.

"DEVITALIZED" AIR.—A dentist advertises to use "devitalized" air. We suppose he makes it by applying arsenic to vitalized air.

EDGAR D. SWAIN, one of the pioneer dentists of Chicago, but for the past three years a resident of New York State, is in the city visiting old friends.

C. F. LEWIS, 46 years old, a dentist, formerly of Burlington, Vt., but for the last thirteen years of London, England, died Feb. 4, 1902, after a year's illness.

COMMENDABLE SUPERSTITION.—Certain Indian tribes of the northwest believe that medicine unless paid for will do no good. Such superstition should be encouraged.

H. B. BARBER, 33 years old, formerly of Naperville, Ill., died at Colorado Springs Feb. 5, 1902. He was a graduate of the Chicago College of Dental Surgery, Class of '89.

ROBERT SALTER, 65 years old, an early active and later honorary member of the Rochester Dental Society, died in that city Jan. 2, 1902, after an illness of several years.

BANKRUPT.—L. F. Brine, Boston. Liabilities $599.97, assets nothing. C. D. Calkins, Waterloo, Ia. Liabilities $130, assets nothing. They will be failing for 30 cents next.

GIVE HIM TIME.—A distinguished dentist was reading an interesting paper on pyorrhea, and one of the listeners asked his neighbor; "Didn't Dr. Blank write that?" "Not yet," was the reply.

WISCONSIN EXAMINING BOARD. The governor has appointed Dr. J. J. Wright of Milwaukee as a member of the Wisconsin State Board of Dental Examiners, to succeed Dr. W. H. Carson.

SACRAMENTO COUNTY (CAL.) DENTAL SOCIETY held its annual meeting Jan. 14, 1902, and elected the following officers: Pres., W. J. Taylor; V.-P., J. B. Simmons; Sec'y and Treas., H. H. Stephenson.

MARRIED.—R. C. Bain, St. Paul, Neb., Jan. 22; Luther Hayes, Bloomington, Ill., Jan. 29; R. F. Jones, Utica, N. Y., Jan. 15; H. E. McClure, Pittsburg, Feb. 2; B. F. Redman, Des Moines, Ia., Jan. 29.

REVIEW CHANGES EDITORS.—The editorship of the *Dental Review* has been transferred from Dr. A. W. Harlan to Dr. C. N. Johnson. Dr. Johnson was the former editor, and we welcome him back to the fold.

LOWELL (MASS.) DENTAL SOCIETY.—A society with this name was organized Jan. 29, 1902, and the following officers were elected: Pres., A. W. Burnham; Sec'y, E. E. Kinney; Treas., E. L. Farrington.

LYCOMING COUNTY (PA.) DENTAL SOCIETY held its annual meeting Jan. 23, 1902, and elected the following officers: Pres., N. R. Hubbard; V.-P., H. A. Krumrine; Sec'y, W. B. Reilly; Treas., A. V. Robbins.

GENTLE HINT.—"What do you think the weather will be to-morrow," asked a subscriber of the editor, and the latter replied, "I think it will be very much like your subscription." The subscriber happened to think of the word "unsettled," and remedied the difficulty at once.

"PRINCIPLES AND PRACTICE OF OPERATIVE DENTISTRY," By John Sayre Marshall, M.D. 635 pages, 722 illustrations. Cloth, $5; Sheep, $6, delivered. J. B. Lippincott Co., 1901. Philadelphia and London.

LORAIN COUNTY (O.) DENTAL ASSOCIATION held its annual meeting at Elyria, O., Jan. 14, 1902, and elected the following officers: Pres., B. E. Saunders; V.-P., E. F. Grover; Sec'y and Treas., B. A. Purcell.

MILWAUKEE ODONTOGRAPHIC SOCIETY held its first annual meeting Feb. 7, 1902, and elected the following officers: Pres., James T. Stuart; V.-P., F. H. Emmerling; Sec'y, G. B. Stewart; Treas., P. B. Wright.

SOUTH DAKOTA DENTAL LAW.—The dentists of South Dakota will test in the courts the constitutionality of the law passed by the last legislature, compelling dentists to pay an annual license fee of $2 on July 1 of each year.

GRAND RAPIDS (MICH.) DENTAL SOCIETY held its annual meeting Feb. 11, 1902, and elected the following officers: Pres., J. Ward House; V.-P., H. D. DeWar; Sec'y, H. D. Watson. Ex. Com., L. F. Owen and W. A. Studley.

OHIO VALLEY DENTAL SOCIETY.—A society with this name was reorganized at Wheeling, W. Va., Jan. 23, 1902, and the following officers were elected: Pres., F. S. Maxwell, V.-P., H. H. Harrison; Sec'y, J. H. McClure; Treas., J. G. Parr.

SENECA COUNTY (O.) DENTAL SOCIETY.—A society with this name was organized at Tiffin, O., Jan. 15, 1902, and the following officers were elected: Pres., F. Gebert; V.-Ps., L. C. Cochrane, G. F. Eddy: Sec'y, F. E. McLaughlin; Treas., R. G. Boyland.

MONTANA DENTAL LAW.—The report of the Montana State Board of Dental Examiners states that at the last session of the legislature certain changes were made in the dental law of the state, which has placed it on an equal footing with those of other states.

"INTERNAL ANATOMY OF THE FACE." By M. H. Cryer, M.D., D.D.S. Regional anatomy of the face offered to students and dentists as a substitute for dissection; Over 150 photographic illustrations. Price, cloth, $1.50 net. S. S. White Mfg. Co., Philadelphia, Publishers.

CHESTER AND DELAWARE COUNTY (PA.) DENTAL SOCIETY held its annual meeting at Media, Pa., Jan. 23, 1902, and elected the following officers: Pres., C. H. McCowan; V.-P., F. M. Smith; Treas., H. L. Smedley; Sec'y, J. H. Campbell. Ex. Com., S. B. Luckie, R. M. Scott, W. Kassab.

FLORIDA VS. HELL.—The icy winter weather suggested to the Sunday-school teacher that it was a good time to imprint a deep lesson on the minds of the children. "Now, Johnny," she said, "Tell me the name of the hot place where bad people go who steal money." "Florida," said Johnny.

GAS NEARLY CAUSES MURDER.—A muscular young man in Pennsylvania took gas last month, and when the first tooth was extracted he jumped from the chair and nearly killed the dentist before help arrived. When he came out from under the influence of the anesthetic he remembered nothing of the occurrence.

HARVARD ODONTOLOGICAL SOCIETY.—At the annual meeting and banquet of this organization Jan. 30 1902, the following officers were elected for the ensuing year: Pres., J. G. W. Werner; Rec. Sec'y, T. T. Estabrook; Cor. Sec'y A. H. Stoddard; Treas., A. S. Burnham. Editor, H W. Haley.

MONEY DANGEROUS—WHEN DIRTY.—The Ohio State Board of Health at its recent annual session adopted a resolution condemning the continued use of paper money after it has become soiled from too much handling. It was shown that dirty paper currency is a prolific source of disease and a fertile carrier of bacteria.

EXTRACTION RESTORES SIGHT.—According to newspaper report, a woman at Houston, Tex., who has been totally blind in one eye for three years, has recovered the use of that organ through extraction of some decayed teeth. They were abscessed, and it was thought pressure was exerted by them on the optic nerve, paralyzing it.

NEW YORK COLLEGE OF DENTISTRY ALUMNI ASSOCIATION held its annual meeting Jan. 15, 1902, and elected the following officers: Pres., John I. Hart; 1st V.-P., Edward Fox; 2d V.-P., H. R. Armstrong; Sec'y, J. O. Taylor; Treas., F. A. Chicherio; Curator, F. J. McLaren. Ex. Com., W. C. Deane, Chairman, F. Fossume, B. C. Nash.

NORTH CAROLINA DENTAL LAW.—A bill to amend the dental law of North Carolina was introduced in the House Jan. 22. It strikes out of the law section three, which provides that all graduates of dental colleges which require a three years' course of study shall be entitled to certificates upon payment of the certificate fee and without examination.

RECOMMENDED TO DR. OTTOLENGUI.—"Dr. Ludlow, a new dentist who is located in Grimsby, claims to be able to fully restore the features to the appearance possessed previous to the loss of any teeth. This restoration of the features is patented, and Dr. Ludlow is the only dentist in Canada who has a right to practice it."—*Grimsby (Ont.) Independent.*

MIXED TREATMENT.—Mr. Kelly—"An' how are ye this mornin', Mistress Flyn? Is your rheumatiz any better?" Mrs. Flyn—"Well, yis, I think it is, I thank ye koindly. The new doctor's treatment is doin' me a worl' av good, I belave. He advoises me to take queen ann eternally, and to rub anarchy on me j'ints. So I'm doin' it, an' I think it's helpin' me wonderful."

DIRT-EATERS.—The newest and craziest fad is dirt-eating, and it originates in St. Louis. The devotees take a spoonful of dirt each day, and the leader of the cult is making a very good living by distributing sand among his followers at 25 cts. per small sack. This is probably on the same principle that a rooster eats gravel, an ostrich cobble-stones, and a billy-goat tin cans.

POWERFUL —An old colored woman threw all the odds and ends of medicine left after her husband's death into the fire. There was a sudden explosion which upset everything in the house, threw the old lady and the stove out of the window and smashed the roof. When she had sufficiently recovered she exclaimed: "Mos' pow'ful movin' medicin' Ah evah sawd. No wondah the ol' man died."

"ANATOMY DESCRIPTIVE AND SURGICAL." By Henry Gray, F. R. S., Lecturer on Anatomy at St. George's Hospital, London. Thoroughly revised American from the 15th English Edition. In one imperial octavo volume of 1246 pages, with 780 illustrations. Price, with illustrations in black, cloth, $5.50 net. Price, with illustrations in colors, cloth, $6.25 net; leather, $7.25 net. Lea Bros. & Co., Philadelphia, Publishers.

MARRIED DENTISTS UNRELIABLE.—A correspondent relates that two women entered his office recently and asked him if he was married. Upon his saying that he was not, one of them made an appointment to have some work done. She explained that the two or three dentist's wives whom she knew always told her confidentially what women wore false teeth, and she did not care to be a walking advertisement for any dentist.

BEANS CAUSE DEATH.—A widow in Philadelphia is suing an accident insurance company for $5,000, same being the amount of an accident policy which her husband had held. He had typhoid fever and nearly died; then when he began to get well he wanted some baked beans, of which he ate a great quantity. The post-mortem examination showed that the beans had perforated his intestines, causing death, and the widow holds that this was an accident. This is the limit.

MUNIFICENT.—On one of the coldest nights this winter a dentist in a small town was routed out at 2 a. m. by a physician to extract a tooth for a patient who had driven in from the country. The physician had first made an attempt and broken the tooth off. With only a kerosene lamp to see by ether was administered, and after several hours work the roots were removed. When the patient recovered he could produce only 50 cents. We have not heard what the professional gentleman produced—probably a club.

"ECKLEY'S ANATOMY OF THE HEAD AND NECK."—Regional Anatomy of the Head and Neck. A text-book for Students and Practitioners of Dentistry. By William T. Eckley, M.D., Professor of Anatomy in the Chicago College of Physicians and Surgeons, etc., etc., and Corinne B. Eckley, M.D., Professor of Anatomy, Chicago School of Anatomy and Physiology, etc., etc. In one octavo volume of 240 pages, with 36 engravings and 20 full-page colored plates. Cloth, $2.50 net. Lea Brothers & Co., Publishers, Philadelphia and New York.

"HOIST BY HIS OWN PETARD."—A young dentist in New England recently tried a sharp advertising scheme. He sent bills and letters to the best people in the city, the latter expressing the hope that their teeth had been in good condition since the last visit, and suggesting that perhaps the patients would better call for a final examination before paying the bill. The object of course was simply to get good people to his office. Soon after a man about twice as big as the dentist called and acknowledged receipt of the letter and bill, the latter being for $15. He stated that all the work which the dentist had done for him was unsatisfactory and that it must be made right at once. The dentist had never seen the man before, of course, but thought discretion was the better part of valor and so gave up the day to

putting in order the worst looking mouth which it had ever been his misfortune to see. After the dentist had used up several hours of time and several dollars worth of gold and other material the man paid the aforesaid bill of $15. The young dentist now is strictly ethical and does not believe in advertising.

CHLOROFORM FOR CHILDREN.—Mr. A. E. Francis read a report, published in the *Brit. Jour. Den. Sc.* of a case in which the administration of nitrous oxid to a girl ten years of age gave rise to "slow, shallow respiration, great lividity, and enormous venous distention—the heart on auscultation and percussion being found to be distinctly distended and a systolic murmur being heard over the displaced apex. The recovery was good, and on a subsequent occasion when chloroform was used no trouble followed." This is another case in support of the opinion that chloroform is well tolerated by children.

PECULIAR ACCIDENT.—This month a physician in Pennsylvania took hi false teeth out of his pocket and put them in his mouth just before starting out to see a patient. He soon after became delirious, and the attending physician detected symptoms of atropia poisoning, which passed away under proper treatment. After recovery the patient stated that he had a queer taste in his mouth soon after inserting the plate, and he believed that a tablet in his pocket containing atropia adhered to the plate and dissolved in the mouth. Any man who carries his false teeth around in his pocket deserves what this one got.

WELDING COPPER.—Professor J. R. McCall, in the *Record* of the University of Tennessee, gives the following directions for welding copper: The copper should be treated with potassium nitrate and a cyanid, after which it is welded to itself, or to iron or steel, in the same way that iron is welded in the ordinary forge shop. A clean fire of coke or charcoal and a temperature of the copper considerably below a white heat insure the best results. A temperature above this makes the metal brittle in working, while one much below will not give sufficient fluidity to the flux. In tension tests the welded joints developed practically the whole strength of the copper.

PATHOGENESIS OF RANULA.—L. Imbert and E. Jeanbrau describe the cysts with ciliated epithelium which are situated on the floor of the mouth and called ranula. The ordinary form is not characterized by its pathogenesis, which is as yet undetermined, nor by its symptomatology nor etiology, but by its histological structure. The various theories in regard to the formation of ranula, such as degeneration of the sublingual glands and salivary retention, seem unsatisfactory to the authors, who have been led to believe in a congenital origin—some defect in development as yet not understood, but perhaps connected with the history of the branchial.—*Med. Record.*

HUNTERS PLEASE NOTE.—A dentist in California writes to the *Dominion Journal* as follows about the close seasons: "1. Those who accept a dental journal three years and then refuse to pay for it 'because it was not ordered' may be killed in any month of the year, preferably January. 2. The man who tells fish stories about his inability to learn anything new at the meetings of his dental societies may be caught with a net in any month, provid-

ing the mesh is large enough to admit his head only. A small herring net is mostly used. 3. The man who joins said dental society, and never attends nor pays his fees, may be shot between October 1 and July 1, both dates inclusive. 4. The man who stands in front of a patient and sniffs at another fellow's root fillings may be trapped and shot from Jan. 2 to Dec. 31 inclusive.

APPENDIX NOT A RUDIMENT.—The opinion has recently been enunciated by a German writer that the appendix is not, as has been supposed, a vestige of some important organ that has served its purpose, but that it is a lymphoid organ analogous to the tonsil. The fact is, as comparative anatomy shows, as we ascend in the animal scale this organ tends to differentiate from the cæcum and to accumulate lymphatic elements. The appendix therefore possesses for man a significance the reverse of that commonly conceded to it. Instead of being a token of atavistic degeneration it is a sign of nobility and of animal aristocracy.—*Med. Age.*

POTASSIUM PERMANGANATE AN ANTIDOTE FOR OPIUM.—Graham Chambers of Toronto, in experiments with potassium permanganate as an antidote to morphin, arrived at the following conclusions: (1) Potassium permanganate in dilute solution, not stronger than one grain to one ounce, may be given by the stomach without danger; (2) subcutaneously it is a poison; (3) grain for grain, it completely decomposes morphin. We find many reports from competent practitioners all over the world detailing the brilliant and even marvelous results from the administration of this most useful drug in all forms of opium poisoning. It seems to act best when given hypodermically, from one-half to two grains at each injection.—T. H. Marable, *Med. Age.*

PHYSICIANS IN THE U. S.—According to the Standard Directory, the total number of physicians in the United States is 115,222. Excluding the colonies this gives an average of one to about 650 people. The states having the greatest number of physicians in proportion to population are as follows: California one to 421; Colorado, one to 433; Vermont, one to 494; Indiana, one to 531. Closely following these are Massachusetts, Ohio and Tennessee. Illinois has one to 612; Iowa, one to 651; North Dakota, one to 1380; North Carolina, one to 1335; New Mexico, one to 1270; Wisconsin, one to 909; Minnesota, one to 888. In cities, Washington, D. C., has one physician to 210 people; Chicago, one to 446; Philadelphia, one to 500; New York, one to 545; Boston, one to 338; St. Louis, one to 471; Buffalo, one to 645 and Milwaukee, one to 806.

BIFID TONGUE.—By H. H. Bywater, M.B.Vict., Preston. The patient, a corporation laborer, aged 35, came to the Preston Royal Infirmary suffering from burns to the face. On asking him to put out his tongue I noticed that it was separated into two parts by a central depression extending backwards for quarter of an inch from the tip. From this depression a median groove (which was deeper near the bifid tip) extended backwards on the dorsum of the tongue and also beneath it. The tongue was of normal size and healthy in appearance. The frenum linguæ was normal. The patient has had this deformity all his life. This congenital malformation is very rare. I have only found mention of one previous case—that communicated by Brothers

to the New York Pathological Society, and quoted by Holt in his book on "Diseases of Children." Gould and Pyle ("Anomalies and Curiosities of Medicine," page 255), refer to cases of supernumerary tongue, and quote that of the Rev. Henry Wharton, who in his journal, written in the seventeeth century, says that he was born with two tongues and so passed through life, one, however, gradually atrophying.—*British Med. Jour.*

BLEEDING AND TENDER GUMS.—

℞ Gelatin, 30 grains.
Sodium chlorid, 8 grains.
Carbolic acid, 2 grains.
Beta-eucain hydrochlorate, 8 grains.
Cocain hydrochlorate, 2 grains.
Distilled water, 3½ ounces.

Use as a mouth-wash.—*Merck's Archives.*

HUNGER.—A German physician says we feel hungry when the blood vessels of the stomach are comparatively empty. Many anemic patients have no appetite even when the stomach is empty; but the blood vessels of the stomach are not empty in such cases but rather congested. In healthy people lack of blood in the stomach acts upon a special nerve and all the characteristic symptoms of hunger follow. Now this hunger nerve, and the nerves of the mouth and tongue, are branches of the same nerve trunk. Hence a stimulus applied to the tongue, by a spice for example, creates or increases appetite. On the other hand, when the nerves of the tongue are affected by a diseased condition of the mucous membrane of the mouth, the patient has no appetite, though his stomach may be empty and he may be in actual want of food.—*Modern Medical Science.*

NARCOSIS OF SCHNEIDERLIN.—Korff has modified the method of Schneiderlin of producing anesthesia by injections of scopalamin and morphin, using the injection at intervals of two hours for a short time before the operation (.0004 scopalamin and .01 morphin). Then during the operation a very small quantity of chloroform, perhaps not more than a third as much as that usually employed, is administered. The advantages are that the patients never suffer any anxiety, never vomit; can be awakened at almost any time during the operation without feeling any pain, and when they recover from the anesthesia have no nausea, and can usually take Vichy water followed by soup or coffee at once. The following night they usually sleep poorly, but are not restless, and the next day everything is normal. He has operated upon eighty cases by this method, and in seven of these no chloroform was necessary. Much smaller doses should be used for children. —*Muench. Med Woch.*

CAME EASY, BUT PRICE WAS HIGH.—My brother read a paper upon dental hygiene before the medical society which met in Augusta last month. I wish to give you an illustration from his observations which will well illustrate the point I desire to make by this paper. In his county there was published and widely distributed a book upon "Tocology, or child-birth made easy." The book called for a diet composed of non-bone and non-teeth

elements for pregnant women; this made the bones soft and yielding, also childbirth easy. He observed twenty-two cases of children born under this process, all of them under two years old, and not in a single case did the child have any whole teeth. Those that did have teeth were suffering untold agony because the teeth had broken off at the gum line; great quantities of pus came from around the teeth. All this evil was traced to the same cause. The mothers had been fed upon sweetmeats and delicacies containing starch, sugar and fine bolted flour; in short, the mothers were deprived of every single article that contained bone building material.—Dr. R. B. Adair, *Dental World.*

GUM CHEWING; ITS EFFECT ON THE TEETH.—A. Lenhardtson publishes in the *Med. Woche* a note upon the teeth of the inhabitants of the province of Dalecarlia in Sweden. He observed that 24.7 per cent of the boys and 28 per cent of the girls in the province of Goedermanland had caries of the permanent teeth, and that 38.5 per cent of the boys and 34.2 per cent of the girls had caries of the milk teeth; whereas in the province of Dalecarlia 15.6 per cent of the boys and 16.2 per cent of the girls had caries of the permanent teeth, and 34.4 per cent of the boys and 42.1 per cent of the girls had caries of the milk teeth. It will be noted that there was but little difference in the proportion of caries in the milk teeth of the children of both provinces. But in the permanent teeth the proportion of caries was very much lower in Dalecarlia than in Goedermanland. This comparative freedom from caries is attributed by the author to the practice of chewing burgundy pitch, which is universal in the province of Dalecarlia. The author furthermore attributes the beneficent action of the gum, not purely to its mechanical effect, but to the oils contained in it, which are of an antiseptic and bactericidal character.—*N. Y. Med. Jour.*

PHYSICIAN'S FEES.—A very important ruling was made by Judge Armstrong at Camden, N. J., on August 2d. Dr. Godfrey, who had attended a woman for four years, put in his claim as a preferred creditor for $349 against her estate, after her decease. It appears that the patient had been suffering from Bright's disease, and while under Dr. Godfrey's care had been recommended by him to go to Bedford Springs, where she died. While she was there another physician attended her. The claim was made by the defendant estate that not Dr. Godfrey, but this other physician, who was called in at the last, attended the patient in her last illness, and that therefore Dr. Godfrey had no *locus standi* as a preferred creditor. In this point of view the court very properly, as it seems to us, declined to concur, but ruled, on the contrary, that Dr. Godfrey did attend the woman in her last illness. It seems to us to be clear that as the attendance was continuous over the period of the illness which ended fatally, until the patient, at Dr. Godfrey's advice, went to Bedford Springs, her being there was in fact part of the treatment prescribed by him, and unless it could be shown that the patient had actually dismissed him after going there, it must reasonably be assumed that she continued to carry out his treatment in general, notwithstanding the presence of another physician, whose attendance should be regarded in the light of

auxiliary aid in an emergency, much as would be the case were the nearest physician summoned, say, in an attack of hemoptysis, when the doctor under whose continued care a tuberculous patient was did not happen to be at home. Surely both physicians in such a case would be properly held to have been in attendance during the last illness.—*N. Y. Med. Jour.*

MALIGNANT DISEASE OF THE TONSIL.—F. E. Hopkins says that the diagnonis between carcinoma and sarcoma in these cases is not always easy. Males are more subject to cancer than females. Epithelioma quickly ulcerates; sarcoma more frequently forms a rounded, smooth, distinct tumor, ulceration occurring later, and beginning at a point which comes in contact with some other surface, as, for example, the base of the tongue. It is stated that carcinoma tends to invade tissues forward, while sarcoma extends backward. The best hope for successful operation lies in early and complete removal. In early sarcoma operation may be performed through the mouth. To shell out the growth with the finger, or blunt dissection, would seem to offer better promise of thorough removal than the use of the knife or the cautery. Any enlarged lymphatic gland should certainly be removed. At a later stage the external operation is to be performed. Coley treated a case of sarcoma of the tonsils with injections of the toxins of erysipelas. The patient died of recurrence, but after an interval of eight years. Massey has reported cures by the cataphoric destruction of cancer cells. Hubbard successfully treated a case of epithelioma of the soft palate by injections of liquid potassæ.—*Boston Med. and Surg. Jour.*

ETIOLOGY OF PHOSPHOR-NECROSIS.—Prof. Ralph Stockman contributes to the *Brit. Jour. Den. Sc.* an extended article on phosphor-necrosis, dealing, especially with the etiology of this disease. He believes that the carionecrosis of the jaw is not due to a specific action of phosphorus fumes, but to a microbic infection. He draws this conclusion from his studies of individual cases, having analyzed the pus from six. He believes that the bacillus tuberculosis is the active cause of the disease, and he supports this opinion by several weighty arguments. A proof of the tuberculous nature of the jaw disease, he says, is to be found by looking through the accounts of post-mortem examinations of fatal cases. In most cases death occurs from tuberculosis of the lungs. Whether this is due to infection from the jaw tubercle, or whether the phosphorus fumes damage the lungs and make them more susceptible to direct infection, I am unable to say. General tuberculosis is also not uncommon, while tubercle of the abdominal glands, and tuberculous ulcers from infection by swallowing the pus, abscess in the brain, purulent pleurisy, and tuberculous meningitis, are all occasional causes of death. Hectic fever and emaciation always accompany fatal cases. The part which the phosphorus plays is not far to seek. The acid fumes (phosphorus and phosphoric acids) produced by its oxidation in the air have no effect on bone covered by gum or mucous membrane; but when they can penetrate to the bone directly through the aperture left by a decayed or extracted tooth or any injury, they erode the bone, weaken its nutrition and resisting power at this small spot, and make it susceptible to infection by tubercle bacilli.

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